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1993-94 — A REVIEW



INDIAN ARCHAEOLOGY 1993-94 — A REVIEW

EDITED BY

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Lalkot & Anangtal
view of excavated site and terracotta human figurines (front cover), glazed pottery (back cover)

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PREFACE

I am pleased to present before you yet another issue of *Indian Archaeology-A Review*, the forty-first in the series. As usual this *Review* incorporates the materials submitted by various organizations engaged in archaeological activities in different fields of archaeology covering exploration, excavation, epigraphy, numismatics, treasure trove, architectural survey, radiocarbon dates, palaeobotanical studies, museums, preservation of monuments, architectural sites, archaeological chemistry and gardens.

My sincere thanks are due to all the State Departments of Archaeology and Museums, Universities, Research Institutions, Laboratories and the various agencies of the Survey. I however, request earnestly to all of them for timely submission of material in conformity with the format, terminology and spellings followed in the earlier issues of the *Review* so as to enable us to bring out the publication in time. It is needless to stress that this is the sole reason for *Indian Archaeology-A Review* being in arrears.

I would like to thank S/Shri R.S. Bisht, C. Dorje, Ms. Arundhati Banerji for compilation and editing the issue and Shri Hoshiar Singh for preparing the dummy of plates and seeing it through the press, Ms. Anju Dhawan and all the staff members of the Publication Section of the Survey for assisting the editors in diverse ways. Lastly, I express my gratitude to Shri Hari Manjhi, Director (Publication) and Mrs. Savi Sagar of M/s Bengal Offset works for their co-operation in bringing out this issue.

S.B. MATHUR

Director General

New Delhi,

March, 2000

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INDIAN ARCHAEOLOGY 1993-94 — A REVIEW

L EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXPLORATION IN DISTRICT ANANTAPUR.—In the course of village-to-village survey, the following villages of archaeological importance were noticed by the Directorate of Archaeology and Museums, Government of Andhra Pradesh.

<i>Village</i>	<i>Nature of remains</i>
Budidagaddapalli	Early historic
Peravali	Glass industry of medieval period
Sasanakota	Early historic site

2. EXPLORATION IN DISTRICT CHITTOOR.— The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of an early historical site at Tondamanadu.

3. EXPLORATION IN DISTRICT CUDDAPAH.— The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of a protohistoric site at Kundili Cherlopalli.

4. EXPLORATION IN DISTRICT EAST GODAVARI.— The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites.

<i>Village</i>	<i>Nature of remains</i>
Bovanapudi	Jaina sculptures of medieval period
Chollangi	Early historic
Devipatnam	Loose sculptures
Gorsa	Late medieval mud-fort
Nemam	Medieval sculptures

5. EXPLORATION IN AND AROUND RAJAHMUNDRY, DISTRICT EAST GODAVARI. — R. V. Siva Sarma of the Archaeological Survey of India¹ brought to light the following sites of archaeological importance during the course of exploration.

<i>Village</i>	<i>Nature of remains</i>
Bommuru	Early historic pottery and remnants of brick-stupa
Devipatnam	Medieval temple
Pedda Kondepudi and Chinna Kondepudi	Habitational mounds and loose sculptures ranging from second century to twelfth century AD
Raghudevapuram	Remnants of medieval mud-fort and early historical pottery
Rajahmundry	Dilapidated brick-temple with an inscription in Telugu (twelfth century)
Ramadurgam fort	Medieval fort, temple and tank
Vemagiri Mitta	Early historic pottery, early medieval temple and remnants of brick-stupa

6. EXCAVATION AT GARAPADU, DISTRICT GUNTUR. — The Birla Archaeological and Cultural Research Institute, Hyderabad, conducted excavation at Garapadu in collaboration with the Nagarjuna University under the direction of G. Kamalakar, Director BACRI and B.R. Subramanyam of the Department of Ancient Indian History and Archaeology, University of Nagarjuna. V.V. Krishna Sastri (Advisor, BACRI), assisted by M. Veerender, Venu Shankar, G. Maheshwari, V. Satyanand Kumar, Narasa Reddy, G. Ramakrishna and others, supervised the excavations in sixteen trenches which revealed the material and settlement of the Neolithic, Megalithic and early historical periods covering a span of nearly two thousand years or more.

Period I (Neolithic), continuing from the lowest level, revealed the most important evidence of nearly ten dwelling-pits of different sizes which were used either for habitation or storage purpose. In these pits, potsherds, stone and bone implements, microlithic blades, steatite beads and charred animal bone pieces were recovered. In the same level, post-holes in circular fashion were also noticed. Two types of burials were noticed, the first type consisted of burying the dead body in full articulation while the second type is marked by an urn-burial or pot-burial exclusively for the dead children. In both the cases, the lower limbs (particularly the ankles) of the skeletons were found missing. As far as the artefacts are concerned, the Neolithic level yielded a good number of polished axes, adzes, microlithic tools, mullers, querns and pounders of stone, steatite beads and bone implements. Besides, the pottery consisted of hand-made coarse red ware, buff ware (sometime burnished), burnished grey/black wares and coarse black-and-red ware.

The occupational deposit of Period II (Megalithic) is very thin. The cultural remains include typical burnished black-and-red ware of Megalithic context and iron implements (scarcely found) along

¹ Archaeological Survey of India is referred to in the following pages as the Survey only.

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with beads of semiprecious stones. The last phase of this culture was found interlocked with the succeeding early historical culture.

Period III (historical) is represented by a very thin occupational deposit which yielded coins of the Satavahana and Ikshvaku dynasties and beads of semiprecious stones besides pottery. No structural remains were found.

7. EXPLORATION IN DISTRICT GUNTUR. — In the course of village-to-village survey, the following villages of archaeological importance were noticed by the Directorate of Archaeology and Museums, Government of Andhra Pradesh.

<i>Village</i>	<i>Nature of remains</i>
Deepaladinne	Medieval
Mupalla	Early historical
Nemalipuri	Early historical habitation and stone sculptures of fifteenth century

8. EXCAVATION AT NELAKONDAPALLI, DISTRICT KHAMMAM. — Excavations were resumed in the monastic complex at Nelakondapalli by the Department of Archaeology and Museums, Government of Andhra Pradesh. Trenches were taken up on the eastern side of the habitation to connect the monastic complex which has been already exposed earlier. Each side of the monastery contained a row of fourteen cells with the main entrance at the centre. The western wing of the complex faces the *mahastupa*. Inside the complex, two square brick platforms were noticed. On the eastern, northern and southern sides of the mound, three *viharas* consisting of a single row of cells were exposed. In front of the *vihara*, a trough made of brick and plastered with lime was exposed. Similarly, another pair of stone troughs was noticed directly built over the foundations of the *vihara*. The moulded bricks with lion and elephant motifs were other important finds unearthed at the entrance of the assembly hall. A good number of terracotta figurines, stone plaques, beads, semiprecious stones, shell and glass bangles, conches, the lead and copper coins of the Ikshvaku and Vishnukundin periods were unearthed. The common forms of pottery include bowls, vases, storage jars, pots and miniature pots.

9. EXPLORATION IN DISTRICT KHAMMAM. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, in the course of village-to-village survey, discovered the following sites of archaeological interest.

<i>Village</i>	<i>Nature of remains</i>
Kakarlapalli	Sculptures belonging to twelfth-thirteenth century
Rudrakshapalli	Sculptures of fourteenth century
Sathupalli	Late medieval sculptures
Thumburu	Chalukyan temple
Togugudem	Temple belonging to tenth-eleventh century

10. EXPLORATION IN DISTRICT KRISHNA.— The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Krishna.

<i>Village</i>	<i>Nature of remains</i>
Magallu	Early historical mound
Majeru	Early historical habitation mound

11. EXPLORATION IN DISTRICT MAHABOBNAGAR.— During the course of village-to-village survey, J. Vara Prasada Rao and R. Krishnaiah of the Hyderabad Circle of the Survey discovered a late medieval temple at Narayanpet and some loose sculptures, temple, bastions and a bathing tank of late medieval period at Ekhlaspur in Makthal taluk.

12. EXPLORATION IN DISTRICT NELLORE.— While carrying out exploration in the villages of Krishnapatnam, Siddulaiah Konda, Pallepadu and Utukuru around Nellore town, a number of sculptures, bronzes of Brahmanical and Jaina pantheons, inscriptions, besides ancient mounds datable from early historical period to late medieval times were noticed by D.R. Gehlot, assisted by R. V. Siva Sarma, J. Vara Prasada Rao, R.Y. Krishna Rao and K. Veeranjanyulu of the Hyderabad Circle of the Survey.

13. EXPLORATION IN DISTRICT NELLORE. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Nellore.

<i>Village</i>	<i>Nature of remains</i>
Kamakuru	Medieval site
Kothapatnam	Early historical and medieval
Thatipartipalem	Medieval sculptures
Tupilipalem	Early historical site
Veerampalle	Early medieval site; Jaina sculptures

14. EXPLORATION IN DISTRICT PRAKASAM. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Prakasam.

<i>Village</i>	<i>Nature of remains</i>
Battepadu	Buddhist carvings
Jangamahesvarapuram	Megalithic burials
Nirimpalle	Megalithic burial complex: early historical habitation site; inscribed pillar of thirteenth century

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15. EXPLORATION IN DISTRICT SRIKAKULAM. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of early historical and medieval sites at Dantapuram in District Srikakulam.

16. EXCAVATION AT GOPALAPATNAM, DISTRICT VISHAKHAPATNAM.—In continuation of the previous year's work {*Indian Archaeology 1992-93 — A Review*, p. 3)\ the excavation was conducted on the eastern side of the village of Veeralametta and exposed a part of a *mahastupa* over a terraced platform. The lower portion of the platform or terrace is found decorated with *kudu* arches. The bricks used in the construction measure 54x27x7 cm and 56x28x7 cm. The Eastern Chalukyan coins and stone plaques are other important antiquities. The excavation also yielded brick structures, tiles, stucco pieces, black-and-red ware, black ware, red ware, knobbed ware, Rouletted Ware, stone fragments with Brahmi label inscriptions, *chhatra* pieces, moulded-bricks, *burnakalasa* motifs in brick, etc.

17. EXPLORATION IN DISTRICT VISHAKHAPATNAM. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Vishakhapatnam.

<i>Village</i>	<i>Nature of remains</i>
Amalapuram	Buddhist structural remains
Dharapalem	Buddhist site
Kotalova	Early historical habitation mound
Lakshmipuram	Early historical site
Madhavadhara	Early historical site

18. EXPLORATION IN DISTRICT WARANGAL. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Warangal.

<i>Village</i>	<i>Nature of remains</i>
Annaram Sharif	Late medieval sculptures and hero-stones
Chennaraopet	Microlithic cores and blades
Chinnavangara	Medieval Siva temple; stone sculptures and hero-stones
Damaravai	Megalithic dolmens
Kadavendi	Sculptures belonging to eleventh-fourteenth century
Kalieda	Dilapidated temple

¹This publication will hereafter be referred to by the year only.

<i>Village</i>	<i>Nature of remains</i>
Kodakandla	Megalithic dolmens
Kondaparthi	Neolithic graves and Megalithic burials
Kothapalli	Medieval sculptures
Mandapuram	Ruined early Kakatiya temple and megalithic burials
Peddavangara	Megalithic burials
Perked	Early historical
Ramavaram	Megalithic burials
Sambhunipet	Early historical mound
Ukal	Siva temple remains of twelfth century and sculptures of tenth-twelfth century
Vangara	Siva temple, medieval period

19. EXPLORATION IN DISTRICT WEST GODAVARI. — The Directorate of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of the following sites in District Godavari.

<i>Village</i>	<i>Nature of remains</i>
Iragavaram	Medieval pottery
Tadepalligudem	Neolithic site

ARUNACHAL PRADESH

20. EXCAVATION AT NAKSAPARVAT, DISTRICT EAST KAMENG.—A systematic horizontal excavation was carried out at Naksaparvat, spread over an area of 3.05 hector, under the supervision of D.K. Bora of the Directorate of Research, Government of Arunachal Pradesh. The excavation revealed four different types of structures.

The first one is having a rectangular plinth with cylindrical and square dressed stone pillars. Over the pillar rested probably a platform similar to one often noticed in a tribal house popularly called *change*. The average height of the platform was probably 1.30 m.

The second type is marked by a square plan and paved with dressed stone slabs and stone blocks arranged systematically to a height of 1.20 m. This probably served the purpose of floor.

To the third category belongs burnt-brick structure with burnt-brick platform raised upto 1.10 m in height. The shape of the house was square.

The last one contains floor made of clay, bricks and pebbles. These types of houses were also square in shape. The existence of post-holes at regular interval of 1.75 m indicates the use of bamboo or wooden posts. The floor of the house was plastered with mud.

The superstructure of houses at Naksaparvat, in all probability, were made of perishable materials such as wood, bamboo, *toko* leaves and cane. These materials are abundantly used even today in the countryside, particularly in the north-east region of India. While mud-mortar was used for flooring, for binding stone slabs and posts, iron clamps, iron dowells and different types of iron nails were used as evident from the excavations. The ceramics mainly comprised stamped ware, brownish ware and glazed ware (Chinese celadon). The common types were bowls, carinated vessels, conical lids, ritual pots and large bowls for storing water and grains, and exhibited a medium fabric. The stamped pottery and those with cord impressions are hand-made while the rest are all wheel-made. In all, twenty stone sculptures representing the tantrik deities, Buddhist holy tree, *dvarapala*, snake motif and Toga figure, etc. were found from the excavations. Besides, a few carnelian and terracotta beads, a large number of fragmented (greenish/bluish) glass pieces were found. Further, the presence of iron smelting kiln also suggests the evidence of iron smelting. In addition, also noticed was a huge stone ring-well (3.45 m X 3.45 m) at the middle of the site. The depth of it was 4.50 m. From the excavated remains it appears that the inhabitants of Naksaparvat probably professed tantrik Buddhism. Evidence of different tribal motifs in sculptures is indicative of the presence of tribal elements in population.

The site remained under occupation between the thirteenth and the sixteenth century AD.

21. EXPLORATION AT TAPOSO, DISTRICT EAST KAMENG. — The Directorate of Research, the Government of Arunachal Pradesh, under Tage Tada in the course of exploration located a stone rampart which is situated in the low hill range near the village of Taposo under the Sijusha Forest Division of District East Kameng (fig. 1). Taposo is inhabited by the Nishis. Possibly, the name Taposo is derived from the river Paso. Though the area is known as Upper Namurah, but the local people call it Taposo. The archaeological ruins are found on the left bank of Paso or Namurah river. The river emanates from the high hill ranges of the Himalayas. The archaeological remains are scattered over an elevated area of about more than half acre of land. The major portion of the fortified site has been already damaged by the river Paso. Only one fourth of the site now remains. A little further eastwards, an open habitational site with intact stone pillar was also found. A large number of roundish stone pillars (average length of one metre), a huge tub, a few household metallic objects, such as bangles, bell, kettle cock and a well-decorated top portion of sceptre were recovered from the ruins. Besides, a large quantity of medium class, red-slipped wheel-thrown pottery was also recovered. However, no hand-made and painted potsherds could be obtained. Mention may also be made of different types of symbols which were found carved on the stone blocks. The purpose of those symbols was, however, not possible to determine. There are traces of a few raised ground which could be identified as open habitational sites.

From the available data one may presume that Taposo was a habitational site which was possibly selected due to the strategic importance of the area. It is well guarded by the hills on three sides and the river on the west.

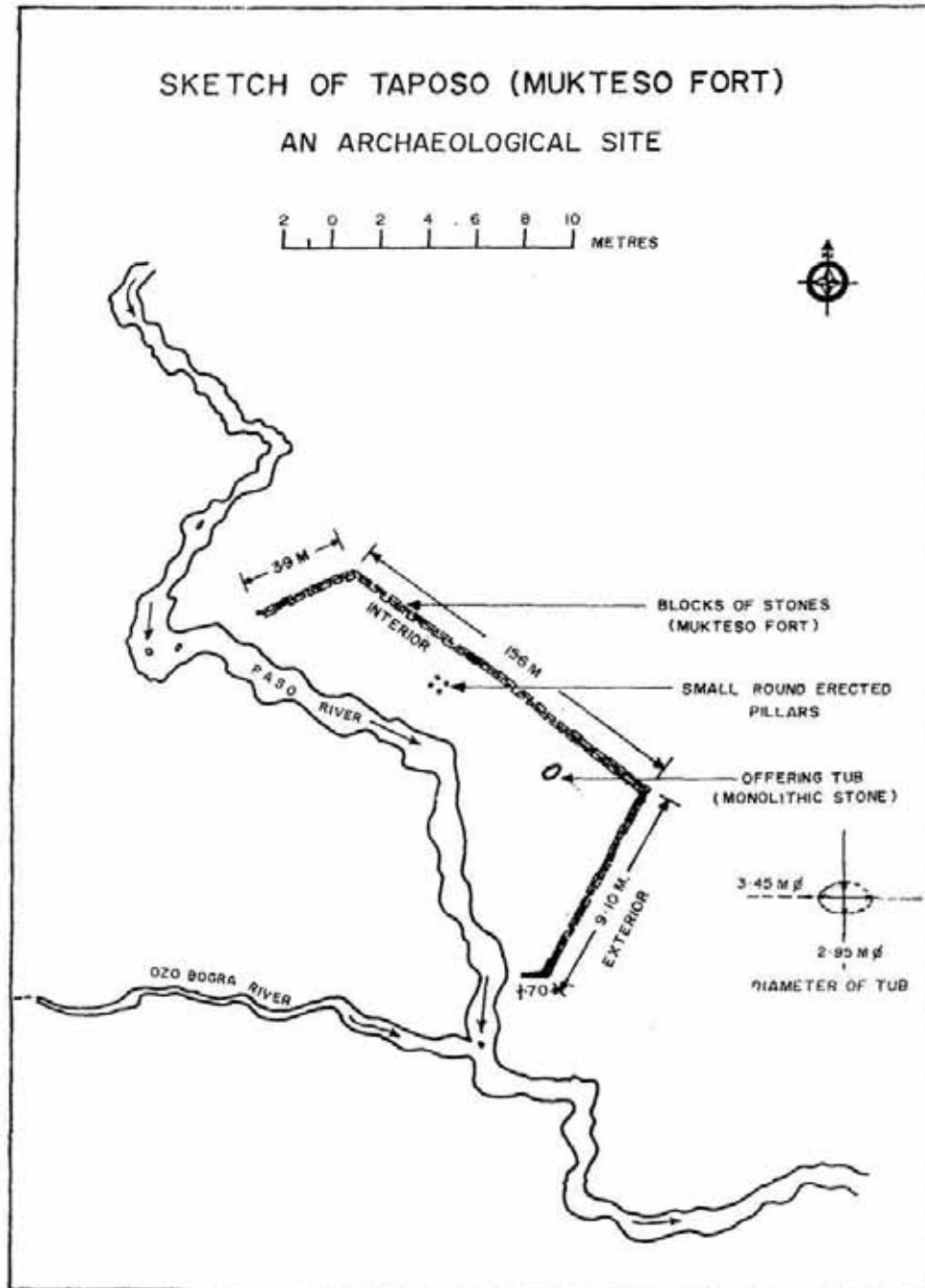


FIG. 1

ASSAM

22. EXCAVATION AT SHRI SHRI SURIYA PAHAR, DISTRICT GOALPARA.—In continuation of the previous season's (1992-93, pp. 4-5) work, D. Bhengra assisted by T.J. Baidya, S.K. Choudhary, P.M. Das, B. Sinha and T.K. Srivastava of the Guwahati Circle of the Survey undertook excavation with a view to tracing the extent of the exposed structures of early and late period.

Excavation revealed a small cell of early period (sixth-seventh century AD) on the western side of the mound. This brick-built cell with a rectangular plan measures (5.10 X 70 m). Original thickness of the wall is 1 m but subsequently the walls were thickened (1.50 m) on the eastern and western sides of the cell. The brick sizes vary (22 X 24 X 6 cm), (21 X 23 X 6 cm), (34 X 16 X 6 cm) and (42 X 22 X 6 cm). In the northeastern side, corner portion of a big wall was exposed. The upper portion of this wall contains beautiful decorative tiles. Among the antiquities, a terracotta human figure, moulded-tiles with geometrical and floral designs are noteworthy. Ceramic assemblage comprises mainly the dull red ware with shapes like small bowls, *chillam*, *diya*, miniature vases in medium to coarse fabric. The structural remains of the later periods (eighth-tenth century) were superimposed over the earlier ones. Irregular pathways and *surkhi*-rammed-floor were also noticed. The structures of this period are badly disturbed.

BIHAR

23. EXPLORATION IN DISTRICTS BHAGALPUR AND SARAN. — Under the village-to-village survey scheme, K.P. Choudhary and K.C. Srivastava of the Patna Circle of the Survey discovered the following sites of archaeological importance.

<i>District</i>	<i>Village</i>	<i>Nature of remains</i>
Bhagalpur	Labokhar	Group of three temples dedicated to Siva, Parvati and Kali
Saran	Basahi	Extensive low mound yielding brick-bats and red ware potsherds datable to Mughal period
-do-	Ibrahimpur	Extensive site with red ware potsherds and stone images of Uma-Mahesvara, Vishnu and Sarasvati, etc., datable to thirteenth-fourteenth century
-do-	Tajpur	Mound with a <i>mazar</i> and an Arabic inscription in Tughra style on a stone-slab; head of some unknown Hindu deity in black stone

24. EXCAVATION AT KOLHUA, DISTRICT MUZAFFARPUR. — In continuation of previous year's work (1992-93, pp. 5-6), the Excavation Branch III, Patna, of the Survey carried out excavation at Kolhua (near Vaishali) with a view to exposing the ancient tank completely. In the previous excavations, traces of a seven-tier brick-lined tank had been noticed but the work was discontinued due to the influx of subsoil water. The tank measures approximately 65 X 33 m, having two bathing *ghats* along the western

and the southern arms with almost one metre wide retaining wall all around. The northwestern part of the tank shows a different style of construction as it has offsets of three inches at an interval of two courses instead of having the tier system as in remaining part of the tank. The western bathing *ghat* was fully exposed.

25. EXPLORATION IN DISTRICTS NAWADA AND GIRIDIH. — A.K. Prasad of Army Education Corps (presently serving at HQ 15 corps c/o 56 APO), while exploring the area, discovered fourteen rock-shelters situated in Kowakol Police Station of the District Nawada and one rock-shelter near Bardauni village in Gawan Police Station of the District Giridih. All these rock-shelters are having paintings, mainly in red and ochre colours though other colours such as black and white were also used. The theme of these paintings comprises mainly the hunting, dancing, gathering scenes, besides other group activities as well as animals such as elephants, tigers, antelopes and wild animals. Reptiles and a gigantic fish (?) are also depicted. The Jogia group of rock-shelters, situated approximately 4 km south west of Sokhodewara village, in the later period was occupied by the Buddhist monks as indicated by the remains of mud-plaster over the walls of the shelters and the presence of clay tablets containing the Buddhist symbols like stupa, etc., in the debris found lying on the floors.

The rock-shelters of Bardauni, apart from the paintings in various colours, also contain engravings hitherto rare in this part.

The area near Ranigadar and Jogia groups of rock-shelters yielded Lower Palaeolithic tools. Mesolithic tools such as different types of blades, points, lunates, scrapers, cores (including a fluted flint core), etc., were found at Bardauni and around Jharanwa and Jogia rock-shelters. These tools are made mainly on chert, quartz, quartzite and crystal.

Numerous microliths of different types at various stages of preparation were found scattered near Jharanwa group of rock-shelters, indicating the site to be a factory site.

26. EXCAVATION AT MANER, DISTRICT PATNA. — In continuation of the previous year's (1992-93, p.6) work, the Department of Ancient Indian History and Archaeology, Patna University, resumed excavation at Maner under the direction of A.K. Singh and overall supervision of B.P. Roy who were assisted by J.P. Singh, N.K. Arya and P.K. Bose.

With a view to confirming the cultural sequence, two trenches, each measuring 6 x 4m, were laid out in the plain ground near the eastern edge of the southern mound overlooking the old bed of the river Son.

Excavations in this area revealed two cultural periods as against the four-fold cultural sequence noticed in the earlier excavations. Period I in this area is represented by the Northern Black Polished Ware (NBPW) deposit having a thickness of 1.20 m which rests over the natural soil characterized by a compact deposit of yellowish red soil. The constructional activity of this period is particularly evidenced by the remains of a burnt brick wall which was discovered at a depth of 4.50 m from the surface. The wall (1.30 X 0.50m) was found running from north to south, consisting of four courses of bricks (0.43 X 0.25 X 0.6 m). Two cast copper coins of the Sunga affinity were found in the vicinity of

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the wall. One of them—a joint piece having two coins, is square in shape. The joint piece having two coins show on the obverse the figure of a tree, while on the reverse is the figure of *chandrameru* made of three arches surmounted by a crescent. Each piece has a diameter of 1.5 cm. The other coin piece which is square in shape has on the obverse a figure which is not very clear, though it appears to be a tiger or Hon. On the reverse there is the figure of a moving elephant. This coin also has a diameter of 1.5 cm. Several such coins of the Sunga affinity were also discovered at Vaishali excavations which show on the obverse the figure of a tiger or lion and on the reverse *chandrameru*. Other notable antiquities of the period include terracotta sealing, animal figurine, skin rubber; stone weight; iron implements and terracotta and stone beads. Associated pottery of this period comprise mainly the Black-slipped, grey, black-and-red and red wares.

Period II is marked by the appearance of the Gupta and the late Gupta antiquities along with the structural remains of burnt bricks. The burnt brick structure is represented by a wall running from north to south which was found at a depth of 4.05 m from the surface. The wall (1.95 X 0.65 m) consists of six courses of bricks. The bricks used in the wall measure 0.25 X 0.14 X 0.6 m. The antiquities belonging to this period include terracotta animal figurines, female head and conical objects; trunk portion possibly of an elephant made of bone; iron objects; terracotta and stone beads. The excavation also yielded fragments of polished red ware, plain red ware and sprinkler in red ware. The topmost layer yielded mixed materials of different periods including sherds of green glazed ware of medieval period.

DELHI

27. EXCAVATION AT BHORGARH, DELHI.—The site (28°5'N; 77°5' E), located at a distance of about 30 km from Delhi Railway Station towards the north, was subjected to excavation by the Department of Archaeology, Government of National Capital Territory of Delhi, under the direction of B.S.R. Babu. A four-fold cultural sequence with a deposit of 1.80 m from the late Harappan period to the medieval time, covering a span of about 2500 years, was noticed.

The lowest level *viz.*, Period I (second millennium BC) at Bhorgarh yielded the late Harappan material particularly the thick red ware pots although the habitational area of this period could not be traced. Two burials, noticed in this period, are significant. One of them was an extended burial in which the body was buried in the north-south orientation. Three pots were placed just behind the head.

A huge quantity of the Painted Grey Ware (PGW) pottery was unearthed in Period II (first millennium BC) representing the straight-sided bowls with sagger base and a miniature *handi*, basin and vases in associated red ware fabric. Circles, concentric circles, semicircles, flowers with three or nine petals, dotted design, dots inside two parallel lines comprise the range of the painted designs on PGW pottery.

In Period III, preceded by a gap, the site was reoccupied under the Kushan rule. Mud-bricks as well as burnt bricks were used for construction. Terracotta animal figurines, one female figurine probably of a mother goddess (?), copper coins, terracotta beads, iron implements and two terracotta sealings with the legend *supakasa* in Brahmi letters are some of the important antiquities discovered

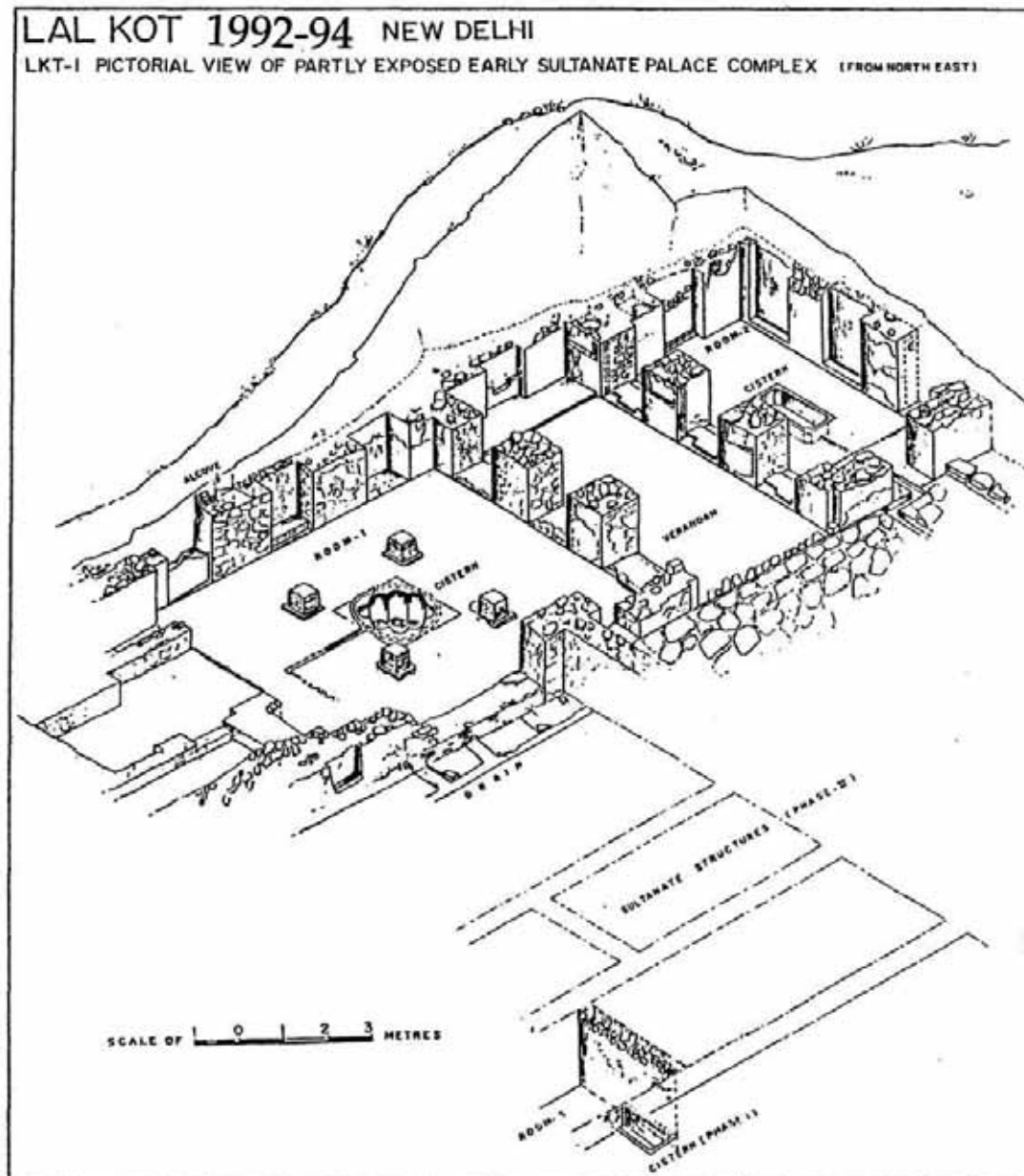


FIG. 2

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at Bhorgarh. Typical incurved bowls, dishes, basins, sprinklers, *handi*, lids, lamp and different types of vases were noticed in this period.

The main concentration of Period IV (medieval period) that was in the eastern side of the mound was unfortunately damaged by the local farmers. A small wall constructed of *lakhauri* bricks and some sherds of *chilam* in red fabric are the important finds of this period.

28. EXCAVATION AT LALKOT AND ANANGTAL, DISTRICT SOUTH, NEW DELHI. — In continuation of the second season's work (1992-93, pp. 6-14), at the citadel of Lai Kot and Anang Tal (28° 31' 40" N; 77° 11' E), excavations were resumed under the direction of B.R. Mani, assisted by Urmila Sant, A.K. Khanna, Vishnu Kant, Purnima Ray, A.C. Chakravarty, M.K. Batra, D.K. Bhardwaj, S.K. Dikshit, R.B. Chhetri, R.K. Sachdeva, G. Nageshwar Rao, Jagdish Chander, H.S. Meyan, Suresh Chand Sankhyan, Suresh Chowdhary, Sunil Kumar, Rajni Shankar and Sanjay Kumar with the objectives: to expose further the plan of the palatial complex (fig. 2); to know more about the structural activities of the pre-Sultanate age; to expose further the plan of the Anang Tal and to have more information about habitational deposits and settlement of other mounds, LKT-1 and LKT-2, besides imparting field training to the students of the Institute of Archaeology, New Delhi. Faunal remains were studied by U.C. Chattopadhyaya of the University of Allahabad.

The excavation work was extended at LKT-1 in the north in squares ZC3, ZC4, ZD4, ZA14, ZB14, ZA15, ZB15 and ZC15; in the east in squares E1 and F1; in the west in squares ZA1 and at LKT-2 in the two quadrants of square YA1.

Only some parts in the three squares—E1, ZD1 and ZC 1—could be excavated upto the levels of Period I (Rajput period). In all, thirty-six quadrants were excavated.

The excavation in the present season revealed all the four structural phases of Period II (early Sultanate period) and three phases of Period I (Rajput period) and the results of the previous year's excavations were confirmed along with some new findings.

Due to extensive structural activities of Period II, the space available for excavation in lower levels was found to be very limited and as such only small parts of the squares ZC 1, ZD 1 and E1 were selected for digging in the levels of Period I (Rajput period).

In continuation of previous year's work (1992-93) in Qd 2 of the square ZC 1, the excavation was started from layer 21 downwards. A structural phase (below peg ZC1) was unearthed at the depth of 7.30 m below layer 22 which was represented by a random rubble wall running north to south. The excavation was closed as there was no space to excavate further in the trench. The structure most probably belongs to the early Rajput phase. A few potsherds recovered from layer 23 could not give clear idea about the dating. They belonged to the pre-Sultanate type only.

Excavation in the lower levels in a limited area in Quadrants 1 and 2 of the square ZD1 continued from layer 5 downwards and closed at the depth of 7-25 m below peg ZD1 due to structural activities of upper levels. The last two phases of Period I were represented by two random rubble walls and layers 7 to 18.

The partially excavated portion in Qd 2 of the square E1 from layer 14 to 22 represents Period I although no structure of the Rajput period was encountered in this trench except for some mud-floors. The natural rocky surface was found below layer 22 at the depth of 6.50 m below peg E 1.

A number of structures belonging to four phases of Period II were encountered in the excavations at LKT-1 and LKT-2.

One of the important structures of phase I is a room of the size of about 13 x 4m which has an octagonal water cistern of size 1.70 X .35 X 60m with two feeding drains at the top, one in the north and the other in the south. The room has three openings of 105m in the east. The courtyard has a lime plastered structure of a basin of the size of 1 X .48 X 1.3m in shoe-shape attached with a drain in the north.

Belonging to the phase II, a number of random rubble-walls, mud-floors, floors made of brick-jelly and part plans of rooms were noticed in different squares. No complete plan of any complex of this phase was exposed.

Among the important structures of phase III are a courtyard of size 6.20 X 6.0m, partly made of mud and partly of stone slabs of various sizes and a partly exposed rectangular water cistern. It was noticed at one place that lime-floor chunks of the preceeding phase were reused for construction of a wall.

The top phase (phase IV) has lime-floors, random rubble-walls and a drain.

It was noticed that at certain places some walls of the height of 4.5m belonging to early phases of Period II were reused in successive phases by raising the floor levels. A mud-brick wall running south to north in Qd 1 of Sq ZD4 is an interesting find of this year's work as the stone was already easily available at the site at the time of its construction. Rubble-stones were used in construction of the walls of Period II, but the fine work including decorations and construction of water cisterns was done by using burnt bricks. Only at a few places, mud-bricks were occasionally used.

An interesting feature noticed was the remains of painted mud-plaster, decorated with a series of crosses and vertical lines in black and ochre colours respectively on lime-wash surface. This plaster was applied over a random rubble-wall.

Reuse of architectural stone fragments of Period I were noticed in the construction of structures of Period II. A fine stone piece of the hind part of a figure of *nandi*, the *vahana* of Siva, was found reused in the foundation of a wall of the early phase of Period II.

In the operational area of the sq YAI at LKT-2, at a separate mound towards west of the main mound, two phases of early Sultanate period (Period II) were encountered over the thin deposit of tiny red ware pieces which probably belonged to the Rajput period (Period I). The thin deposit was found overlying the natural disintegrated micaceous rocky surface or the rock itself. The early-Sultanate phase is represented by two partly exposed random rubble-walls, mud-floor as well as lime-floor. The later phase is represented by two partly exposed small rooms along with a portion of courtyard and another random rubble-wall. One room has the evidence of two successive layers having lime-floors and drain. The drain opens towards the south probably in the courtyard and the capstone of the drain has mason

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marks. There seems to have been no occupation at the site after the second phase. Probably, water stagnation occurred at the site in this low lying area. The rain-water deposit is represented by the regular clay and *chharra* associated with other eroded material lying over the structure-bearing levels of Period II. Later, the area seems to have been used as a refuse pit.

In continuation of the previous year's work, excavation was resumed in Anang Tal, believed to have been constructed in the middle of the eleventh century AD by Anang Pal II, the Tomar ruler of Delhi. The excavation was carried out in square PI to know the structural details of the northeastern corner plan and its connection with the already exposed portions in the west and in southwestern corner of the tank.

The exposed part of this year's work seems to be the upper part of the northeastern corner of the reservoir consisting of a thick lime-plastered retaining wall having a batter was attached at the bottom with a wide landing platform below which lies the staircase both in the north and east. Another landing platform was noticed below the staircase.

The partly exposed thick lime-plastered face of the retaining wall made of brick courses in stepped manner had the total height of more than 1.80 m. The lime-plastered slope had a horizontal joint at the lower half with a slight change of angle of the slope. Thus, both the partly exposed northern and eastern walls made the northeastern top corner of the reservoir with a joint at the meeting point. Below this, the wide landing platform was provided with a flight of twelve steps to land on the lower platform. Eleven steps in the eastern side have been exposed, the top one was found to be disturbed. The whole portion was buried under the accumulated debris of different periods.

The steps, constructed of dressed rectangular stone blocks, strengthened by iron clamps, have shown the rise and tread of about 15 to 25 cm with a total height of about 2.40 m. The lower platform is made of stone slabs of various sizes and was unearthed to about 3.50 m towards the south and to about 1-30 m towards the west. In the northern side, only three lower steps, joined with those of the eastern side, were exposed. Almost every stone used in the construction of the flight of steps has a mason mark on it. Amongst these mason marks, the bow and arrow and triangle are frequently used.

The total excavated part of the Anang Tal in the three season's excavation work suggests that the plan of it was not a perfect square or rectangle. It rather follows the contours of a natural depression. It also suggests that the main entrance to the tank was probably from the south.

The ceramic industry of Period I (figs. 3 and 4) was represented largely by red ware, both plain as well as decorated. A few sherds of black-slipped grey ware were also found. By and large, the pottery was having medium to fine fabric and is well-fired. Bowls were made of finer clay while the other vessels were made from the clay which was neither very fine nor coarse. Mica dust was occasionally used as a grit-component in the case of medium-sized vases. Another notable feature of this period was the treatment of painting in black colour on the rim or shoulder of the vases, lids and basins. Of the slipped pieces, most of them had evidence of red slip only. Occasionally, they had chocolate slip. The black slip was applied only on the grey ware. In some cases, a pinkish white wash was applied on the shoulder of the vases decorated with incised patterns such as wavy lines bordered by a pair of horizontal

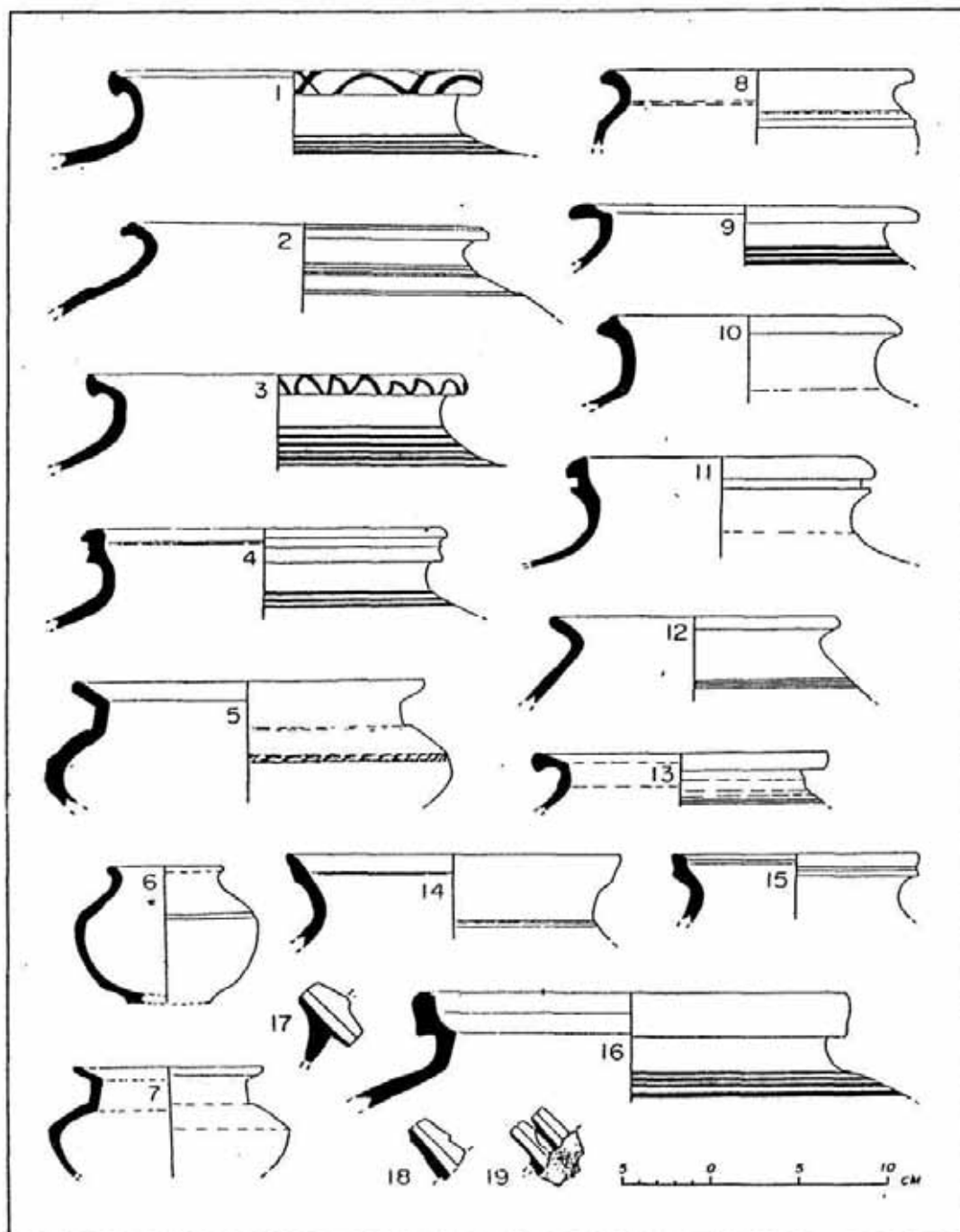


FIG. 3 . Lal Kot : plain and decorated red ware, Period I

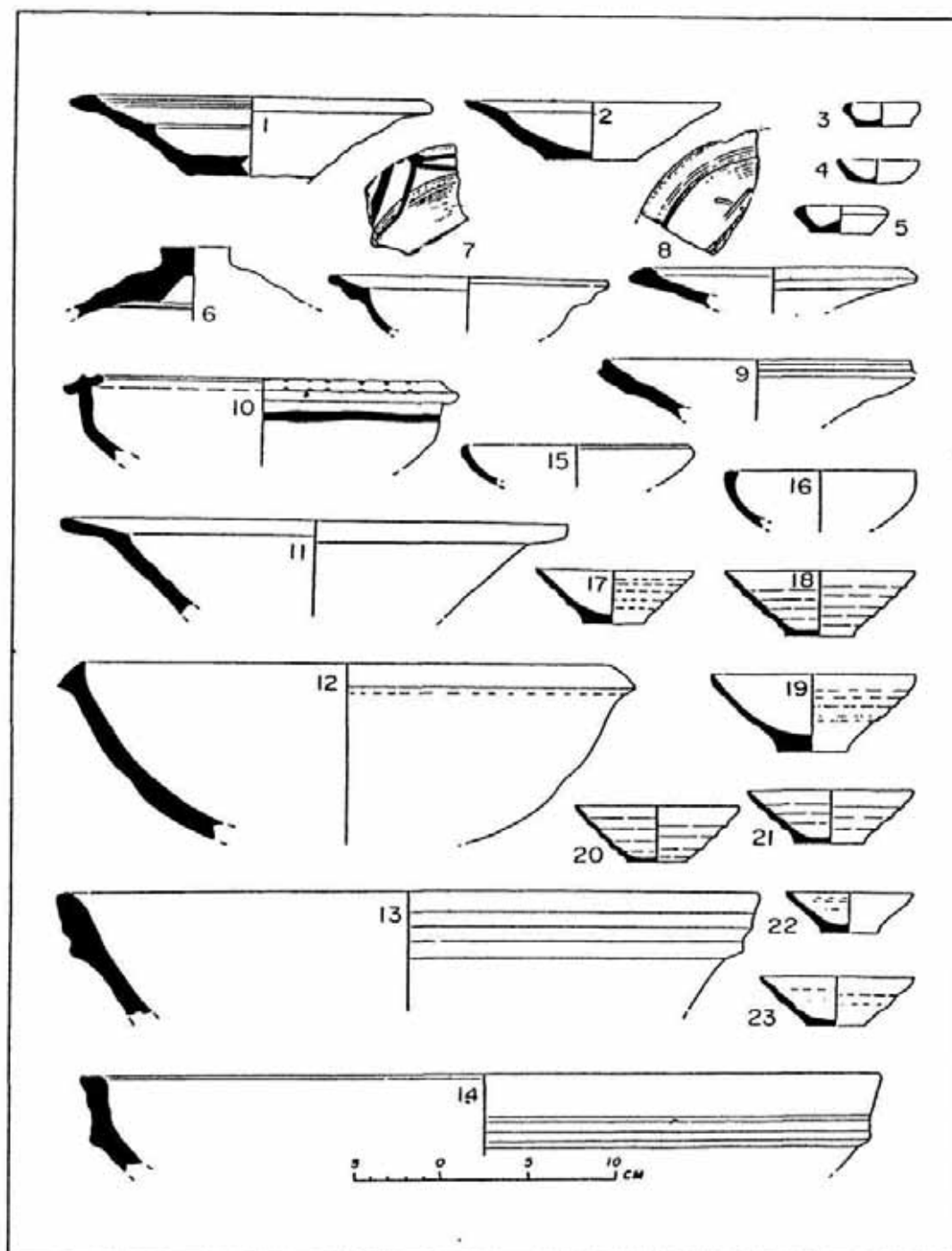


Fig. 4. Lal Kot : plain and decorated red ware, Period I

lines, zig-zag lines or a pair of vertical lines in-between a pair of wavy lines and the whole area was bordered by horizontal line. In some cases the designs were made over the surface washed with pinkish white colour. A few sherds had the decoration of vertical or oblique lines on a horizontal rib at the lower part of the shoulder.

The painted decorations were noticed on the exterior at the shoulder and rim in case of lid in the interior like a pair of strokes bordered by the horizontal lines, zig-zag lines, criss-cross design bordered by the horizontal line and black leaves.

In the stamped decorations the chequer-pattern was more popular in this period. Few sherds were decorated with the vertical lines of dots in-between vertical lines in relief and a bowl is found decorated with the vertical lines of dots in circle on the exterior.

The pottery was found in the shapes of bowls, basins, lids, cooking *handis*, vases, miniature vases, lamps and spouted vessels.

Bowls were the most frequently used pottery of this period. Almost all of them had sharp-edged rim, tapering profile and disc base. In some cases, disc was small and not so prominent. A few sherds had vertically square cut with or without grooving on the exterior below the rim. Two odd pieces of incurved rim bowls suggest the evidence of the Kushan pottery tradition in this period.

Basins had nail-headed rim and convex or ledged profile, a few of them were painted at the top of the rim. Almost all of these nail-headed basins have additionally a rib at the top of the rim and also painted with vertical strokes at the top of the rim and a horizontal line on the exterior of the convex body.

Amongst lids, there were two distinct types—one having an inverted flat terminal top or a flared rim, convex profile and flat base. The latter generally had painting on the interior, particularly on the top of the rim and in a few cases in the centre.

The cooking *handis* were found with or without carination. In some cases, the rib was applied at the lower part of the shoulder which was occasionally decorated with vertical or oblique incised lines, short shoulder. *Handis* with ledged shoulder were also present. In some cases, the lower part was treated with mud paste or a rough surface.

Vases had different types of rim, i.e., nail-headed rim; horizontally splayed-out rim with or without depression on the exterior; internally oblique-cut rim; externally ledged-rim, etc. Most of the vases had decorations at the shoulder or at the rim. All three types of decorations were found on the vases.

Miniature vases had a simple splayed-out rim and a saggar base. Lamps were small with short convex body and disc base. The plain spouts recovered from the levels of Period I showed the presence of spouted vessels of single as well as double mouths. Red ware circular discs or hopscotches were found from different phases of the period.

The glazed ware, both sandy friable as also of ordinary terracotta core, was profusely used in Period II. Other notable feature of this period was the presence of foreign elements in the ceramics, i.e., (i) the Chinese celadon ware; (ii) fine quality of thin (monochrome and polychrome) glazed ware probably of West Asian origin; (iii) and a few sherds of porcelain in uppermost strata.

The other associated pottery was mainly a red ware. Occasional use of grey ware, both plain as well as decorated was also present. By and large, the pottery was wheel-made, though there did occur some examples which were exclusively hand-made. The green glass ware also made its remarkable presence in this period. A few sherds of stone ware were also found.

The glazed ware with whitish or brownish sandy/gritty friable core were found in the shapes of dish, shallow to deep bowl, fluted miniature bowl and ink pot with ring base. The latter two were the new findings of this season. The sherds were decorated with painted geometrical and floral designs but two pieces were painted with faunal patterns such as fish. Two sherds bore Arabic inscriptions: the first one in blue colour applied in relief on a bowl and the other painted in chocolate colour on a dish are also included in the series of new findings of the season.

Dish, shallow to deep bowl and ink-pot were the main shapes in the glazed ware of ordinary terracotta core, both plain as well as decorated. The latter one was also an additional find of this season.

The evidence of stitching the broken pots with metal wire was repeated in the celadon pottery. In addition to the white to greyish well-levigated China clay or hard paste variety, i.e., imported green celadon ware, the indigenous rough variety with brownish sandy/gritty friable core was also found.

The stone ware itself was a new finding of this season. A sherd of grey stoneware trough with a lug handle has the holes for stitching with iron wire or clamps and another sherd of a bowl made out of white marble were found.

The important shapes of the red ware (figs. 5 and 6) were storage jars, basins, *borasi*, i.e., heater, medium-sized vase, cooking *handi*, pans, handled pots, bowls, lids, miniature vases, spouted vases, lipped lamps, lamp-stand and flower vases. Amongst these, a handled *cup/lota* fully decorated with stamped design in relief, had a long convex foot. A flower vase, attached with a pan at the narrow and closed bottom and decorated with applique design, had four finials on the rim of the pan. They were the interesting finds of this year.

The black-slipped grey ware (figs. 7-8) is found in the shapes of nail-headed basins, pans, *handi*, medium-sized vase and finials.

The ring base and lips in lamps were the main features of the early Sultanate pottery. The painted decoration on red ware was mostly in black colour but, in some cases, white was also applied on the interior of the bowl and on the shoulder of a vase. The golden and silvery dust was also occasionally used in painting on pottery. Some sherds of vases having decoration on the shoulder with elephant, horse, lion and other animal motifs in relief were found in red ware as well as in black-slipped grey ware.

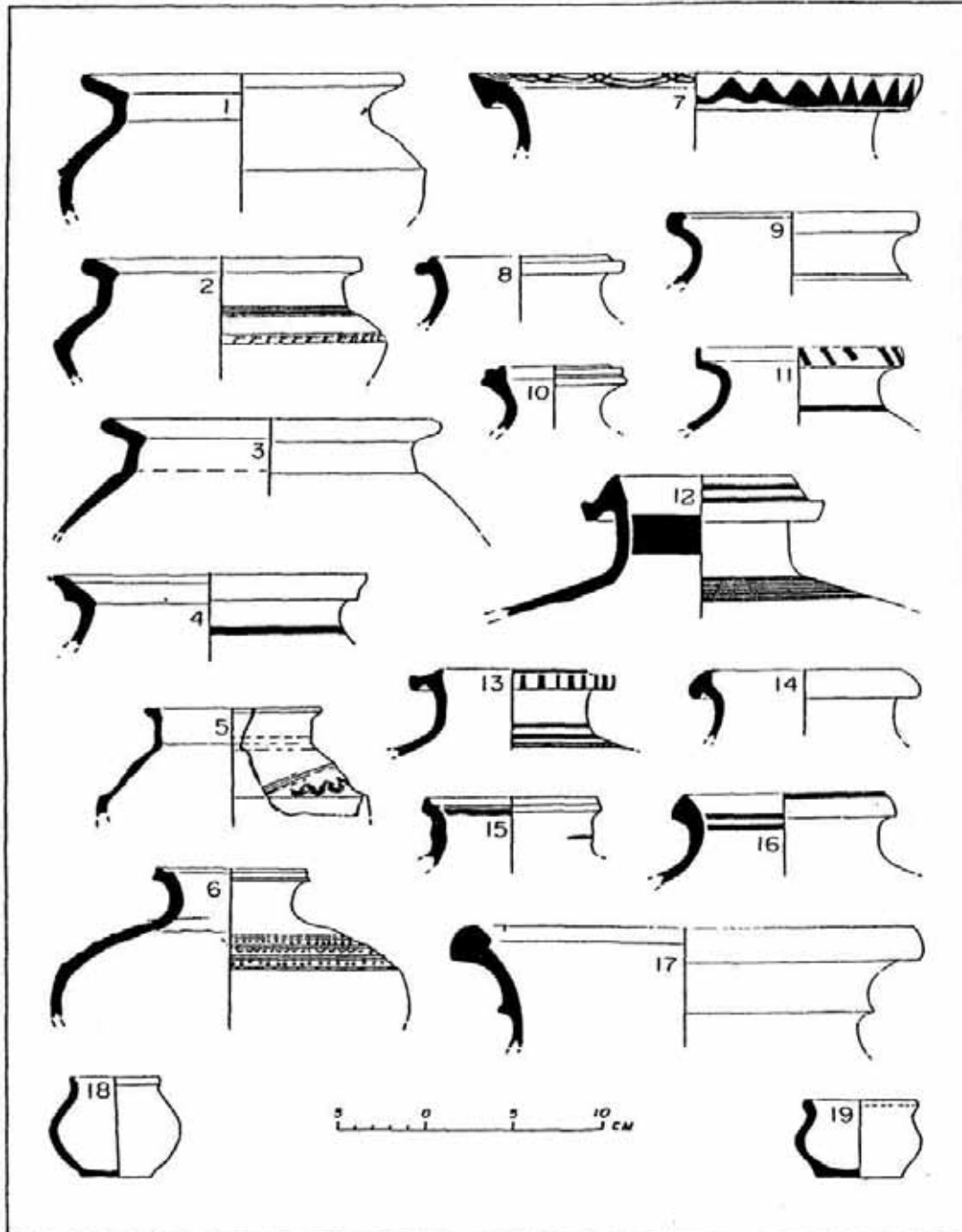


FIG. 5. Lal Kot : plain and decorated red ware, Period II

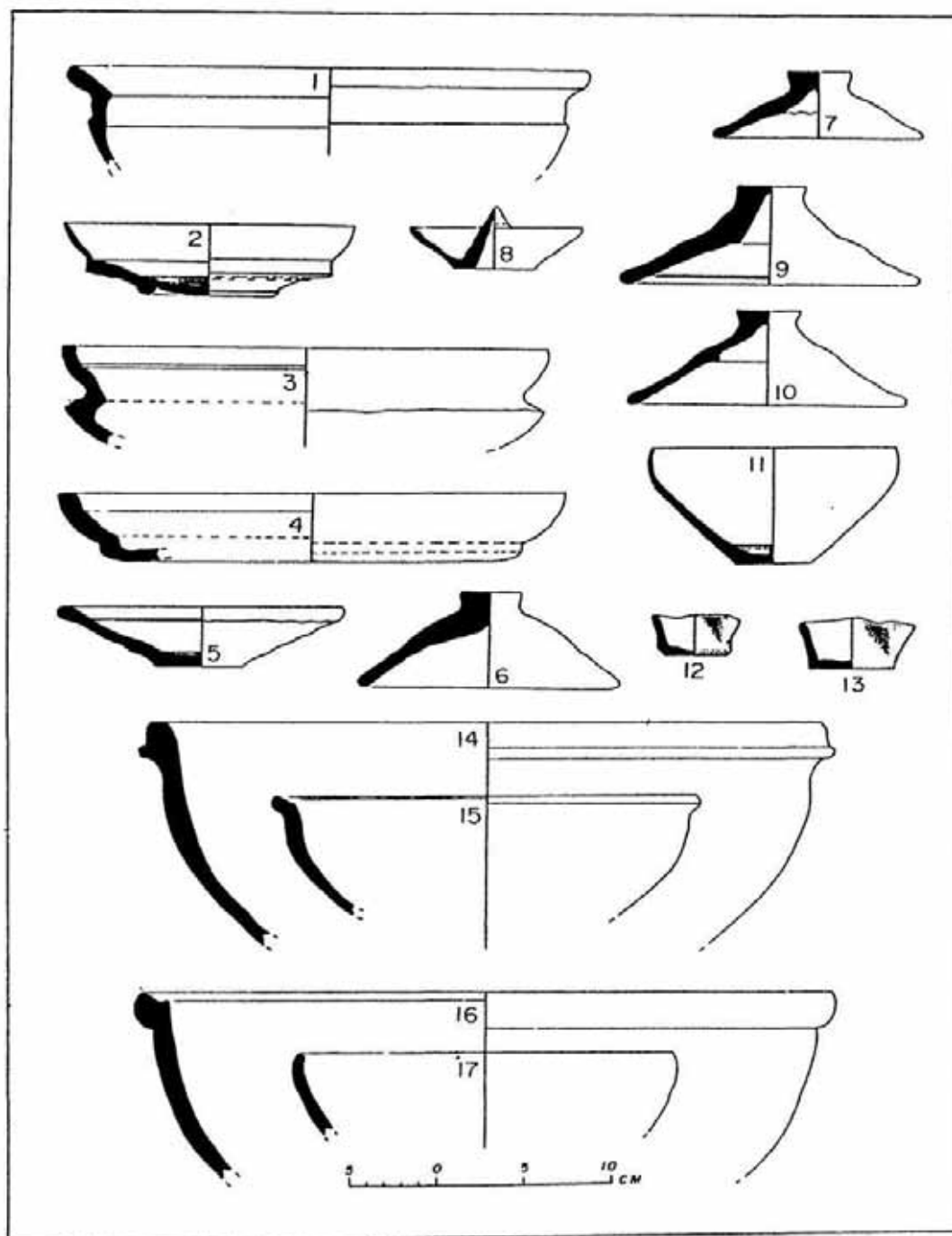


FIG. 6. Lal Kot : red ware, Period II

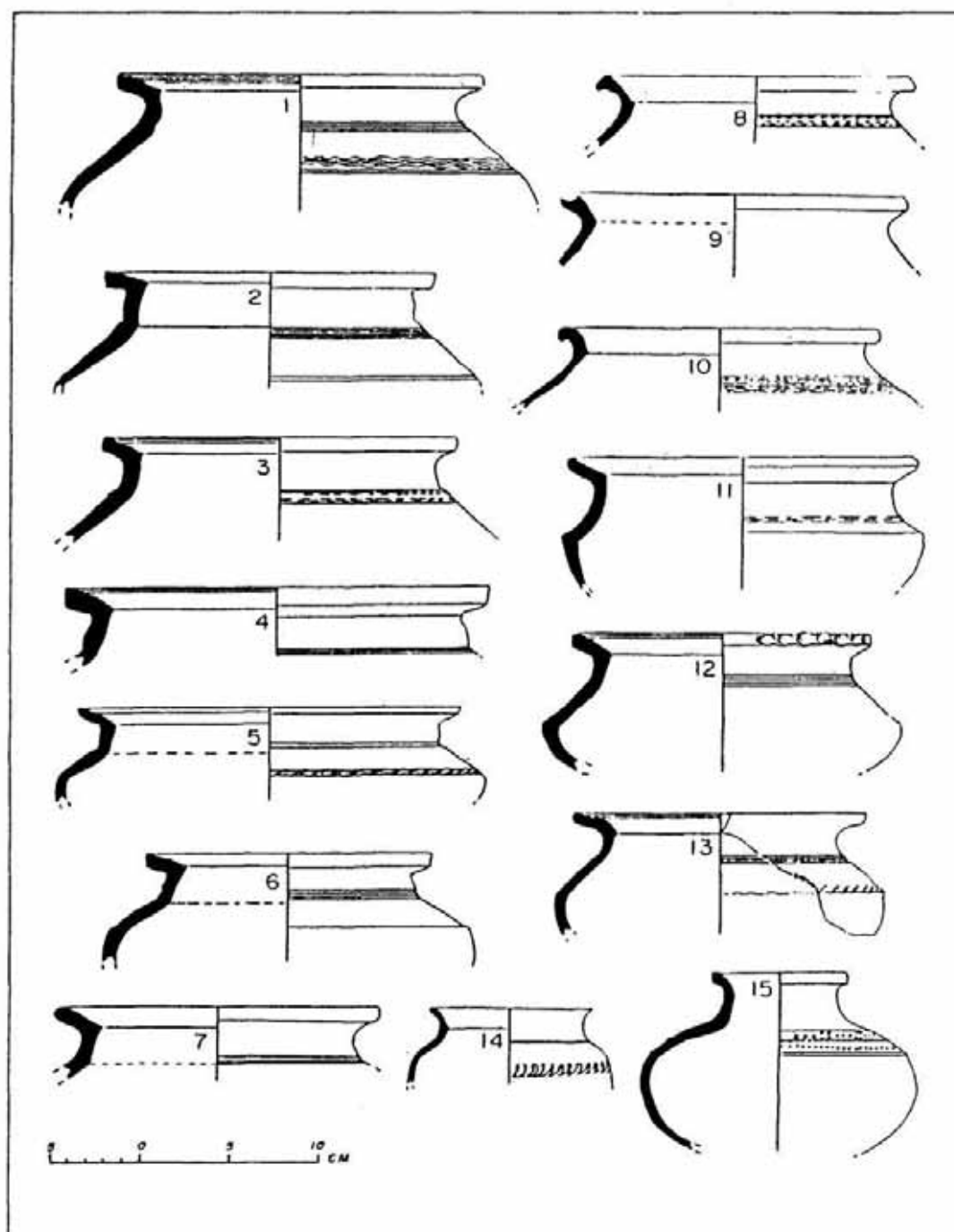


FIG. 7. Lal Kot : plain and decorated black-slipped grey ware, Period II

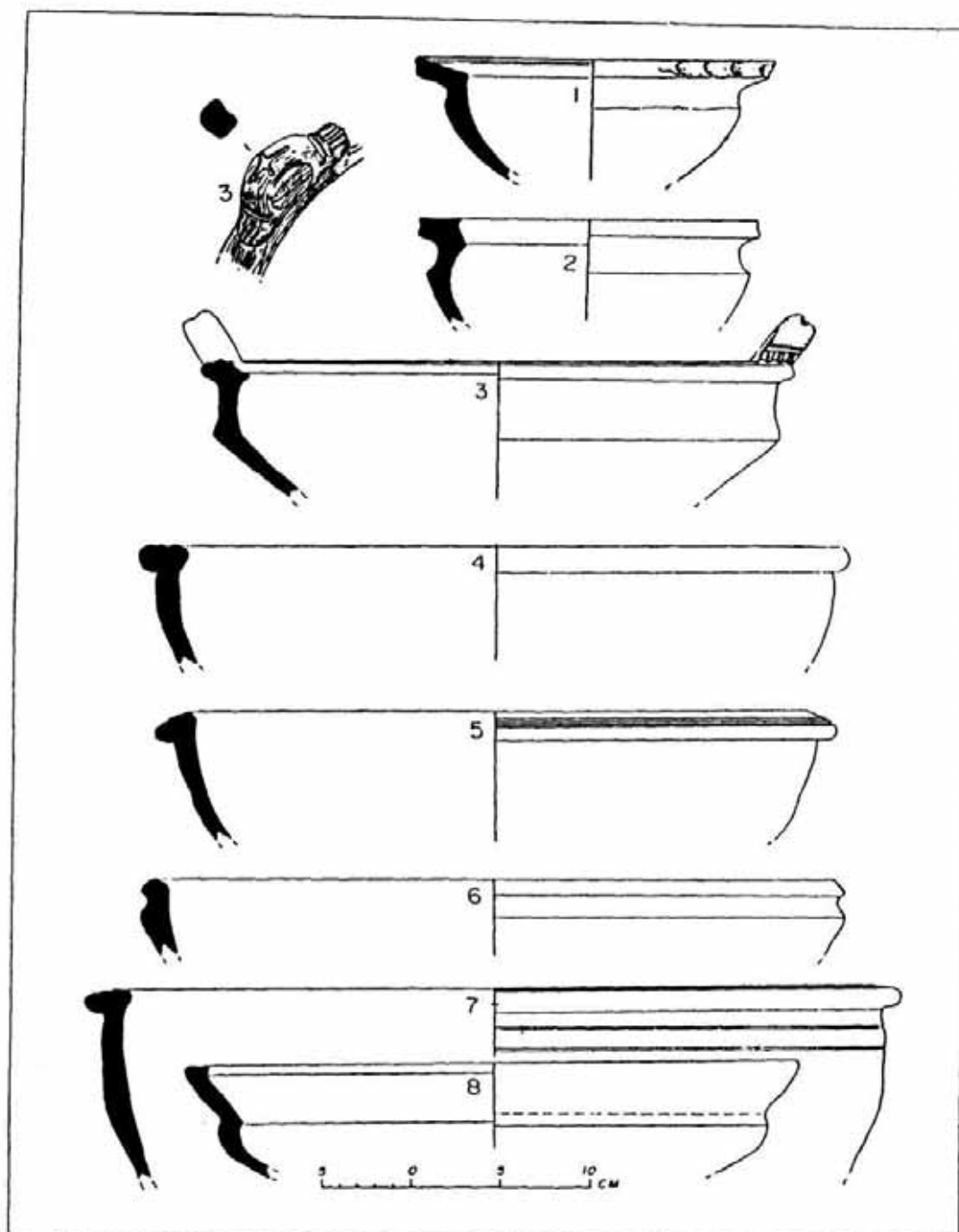


FIG. 8. Lal Kot : plain and decorated black-slipped thick grey ware, Period II

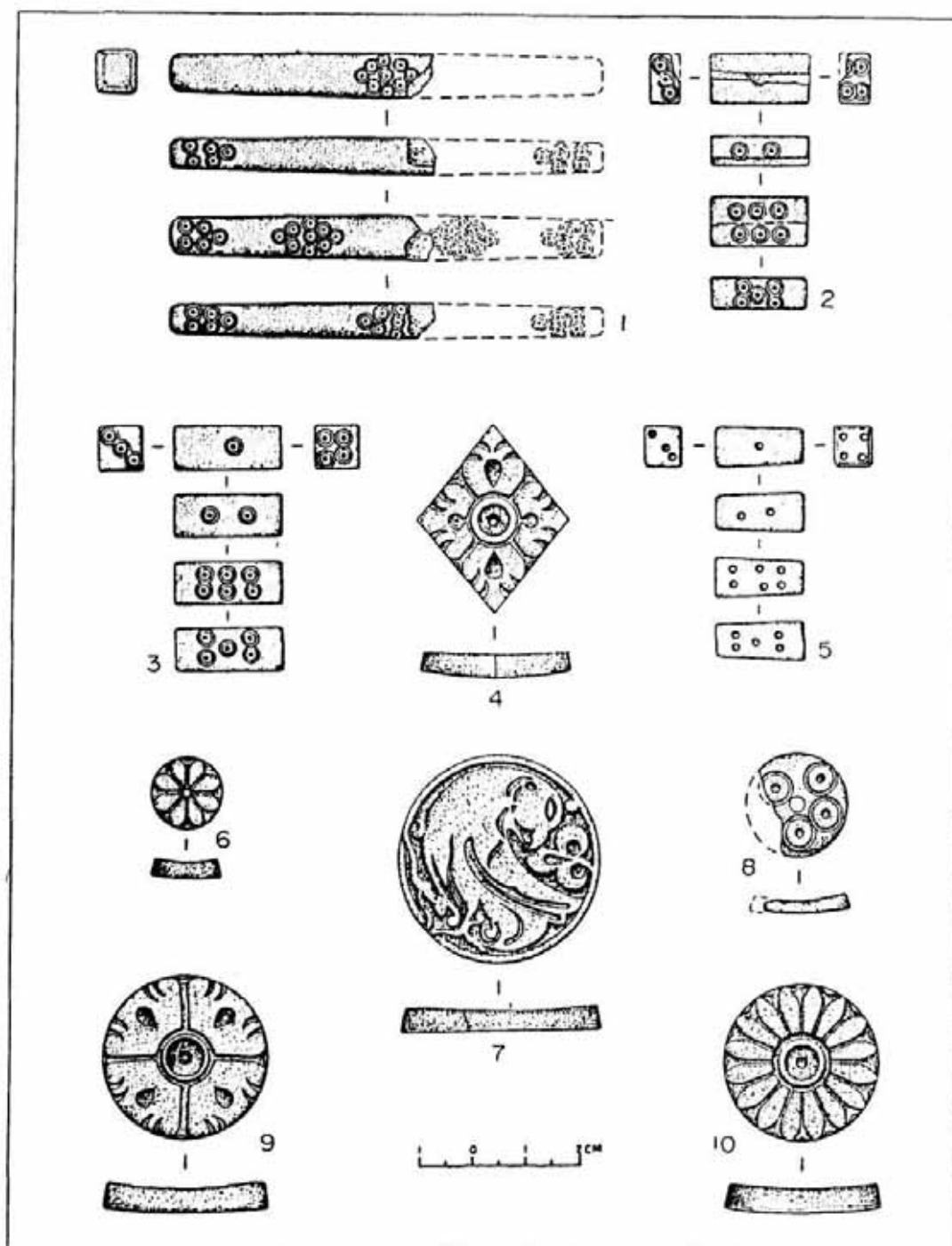


FIG. 9. Lal Kot : dice and studs, Period II

More than fifteen hundred antiquities have been found during excavations of the third season at Lai Kot, mostly from the levels of Period II. In total, one hundred and eighty-nine copper coins of the Rajput kings and the early Sultans of Delhi; eighty terracotta human figurines including one female deity; two hundred and twenty-six terracotta animal figurines; four hundred and fourteen beads and pendants of glass, terracotta, semiprecious stones and other material; one hundred and seventy-eight bangle pieces of glass and other material; two hundred and eighty metallic objects; four fragments of stone sculptures; thirty-four ivory objects (fig. 9) including rings, gamesmen, dices, bangles, human head and pendants; twofold foils, studs and beads; one silver foil amulet and other minor antiquities have also been recovered from excavations.

The preliminary study of the faunal remains recovered from the excavation at Lai Kot brought to light the fact that only goat and sheep (*capra/ovis*) were for food in the Rajput period. Out of forty-two bone samples, forty-one belonged to them while only one that of buffalo (*Bubalus bubalis*). But interestingly, during the early Sultanate period, a variety of animals and birds were included as items of food.

GUJARAT

29. EXCAVATIONS AT SANTHLI AND DATRANA, DISTRICT BANASKANTHA. — V.S. Parekh and V.H. Sonawane, assisted by P. Ajith Prasad and P.C. Choudhary of the Department of Archaeology, M.S. University of Baroda, carried out excavations simultaneously at Santhli and Datrana in Radhanpur and Santalpur taluks respectively. These two sites are situated at a distance of 60 km apart. But, at Datrana, only a trial excavation was done to check the sequence and nature of deposit at a large factory site of the blade industry. Santhli, on the other hand, is a small ephemeral settlement of the Chalcolithic community affiliated to the Harappa culture.

The Chalcolithic site Santhli (23° 54' N; 71° 29' E), locally known as "Gachi no thumdo" (Santhli-II), is located about one and a half km south-west of Santhli village, on a large stabilized sand dune. Habitation debris at the site shows discrete concentration on the surface and it is spread to an over all area of about 120 X 90 m. Four trenches measuring 5 X 5 m were opened up at selected areas at the site after assessing the surface indications of habitation deposit. The excavation revealed a total habitation deposit of 40 cm belonging to two distinctive cultural periods, Period I and II.

Of these, Period I, represented by the second layer having a cultural deposit of 25 to 30 cm, belonged to the Mesolithic culture. The deposit included typical Mesolithic artefacts of both geometric and non-geometric microliths which consisted of tool types like lunates, triangles, trapezes, crescents, different types of points and backed-blades along with blade-cores and flake-cores. These tools were made on fine siliceous materials like chalcedony, chert, agate, jasper and occasionally on quartz. Besides, a number of small pieces of flat sandstone slabs or "palette-stones", generally associated with the Mesolithic assemblage in Gujarat, were also recovered from this deposit. In spite of the large area occupied by the Mesolithic community the number of finished artefacts and lithic debitage found in the site were not rich due to the fact that the site might have been occupied only seasonally by the Mesolithic hunter-gatherers.

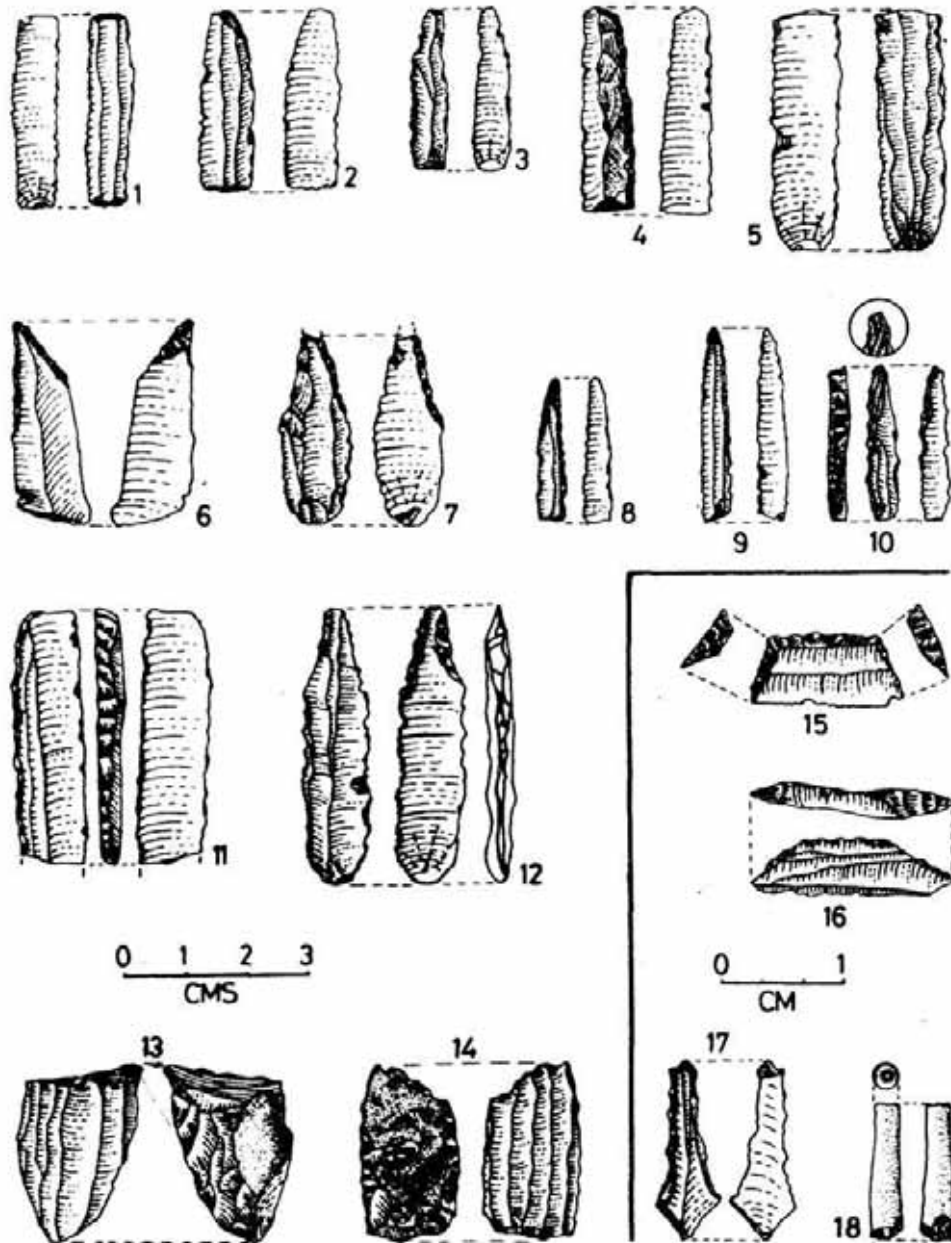


FIG. 10. *Dattana IV: mesolithic and chalcolithic artefacts*

The deposit has, however, yielded a large quantity of skeletal remains of the animals hunted by the Mesolithic community. Apart from a large collection of long bones, more than seven skulls of a large cattle with intact mandible and large cores were found in the excavation (pl. I A). From the features of the skeletal elements it seems, these huge skulls are of a wild species of cattle. The bones are found as discrete clusters within the trenches. The largest of such a cluster contained four such skulls piled together along with other bones. The site, might have, therefore, been a butchery and food processing site of the Mesolithic community. Apart from this, the macrofaunal remains collected from the site included skeletal remains of sheep/goat, gazelle, pig, *equuid* sp. (*Equus hemionus* ?) and that of fish.

Period II at the site is represented by a patchy and sparse, hardly 10 to 15 cm, deposit of Chalcolithic habitation directly overlying the Mesolithic. The deposit included a few sherds of pottery, and an equally non-descript stone and shell beads and bangles, all indicating a very ephemeral habitation at the site. However, the Chalcolithic deposit incorporated two extended inhumation burials. Both the burials were oriented east-west with head resting on the east. Among these the first burial is an extended joint/double burial of two adult individuals interred in the same pit (pl. I B). The bodies were found resting on their back with their head tilted in an awkward position and facing each other. Associated with the burials were found five pottery vessels of different shape. All these vessels are similar to the pottery found in the burials at Nagwada.

The second burial is that of a small child and this also is associated with a few pottery vessels mainly the large beaker type vessels and a large, shallow bowl or dish with a straight rim, similar to the types found in the first burial. But, the vessels were indifferently baked, due to which they showed a tendency to crumble easily. No other burial goods were found from both the burials.

Most of the pottery found at the site on the surface and in the excavation are, in fact, sherds of the burial type pottery, indicating that there were a few more burials at the site which are now being disturbed due to ploughing and erosion. It is also important that no structural remains of any sort could be located at the site. Subsequent exploration around the site revealed a few more sites in a radius of 5 km, showing exclusively burial type pottery; that too, only small numbers and bereft of other cultural remains.

The excavated site, Datrana-IV (23° 41' N; 71° 08' E), is located about 1 km west of Datrana village on a large crescent-shaped fossil sand-dune. Weathering and erosional gullies have dissected this large dune creating an impression of three distinctive gentle eminences. The artefact spread, consisting mainly of lithic blades and industry waste with a few potsherds, at this site measures more than 50 hectares. It is one of the extensive factory sites of Chalcolithic blade industry in north Gujarat and Kachchh.

A trial trench was put at a carefully selected area with the limited objective of knowing the nature of deposit and sequence of occupation at the site. It revealed a total deposit of 90 cm belonging to two cultural periods. The earliest deposit, Period I, represented by the layers 4 and 3, belonged to the Mesolithic period which yielded typical Mesolithic artefacts: the microlithic geometric (fig. 10:15,16) and non-geometric tools in association with the microlithic industry debitage, and the "palette stones" of sandstone, along with a number of different skeletal remains of the exploited animals.

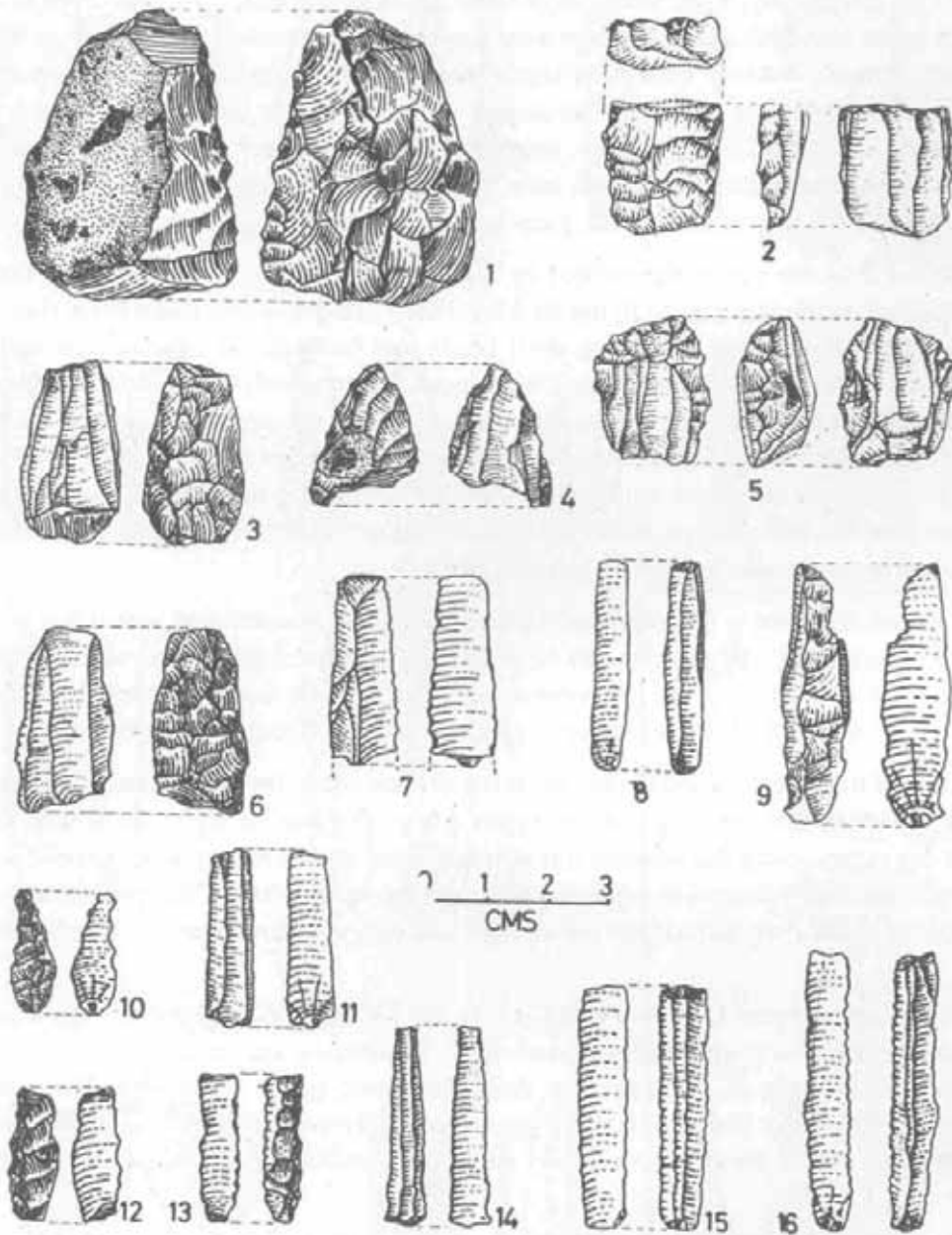


FIG. 11. Dadrana IV: chalcolithic blades and cores

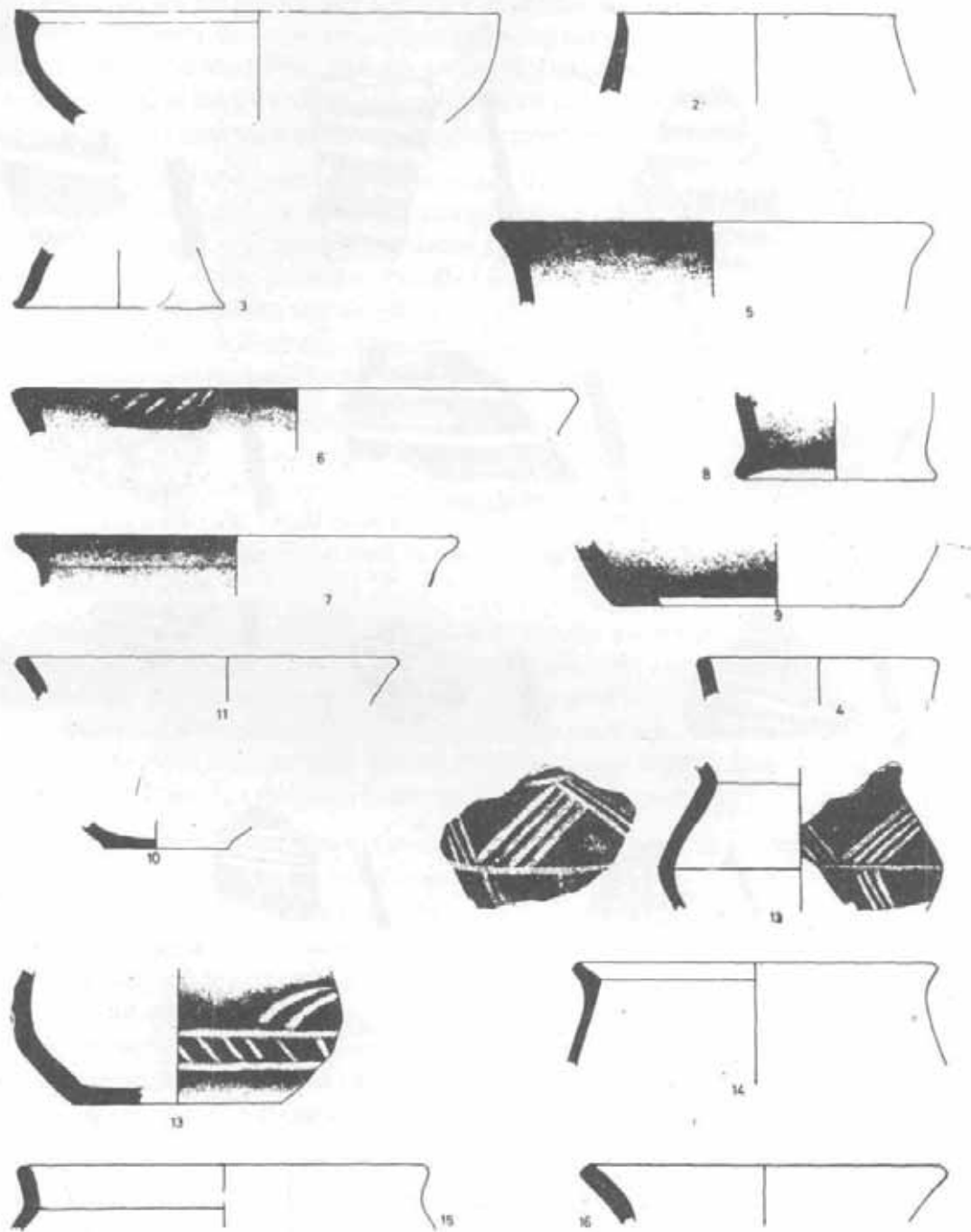


FIG. 12. *Datrana IV: chalcolithic pottery*

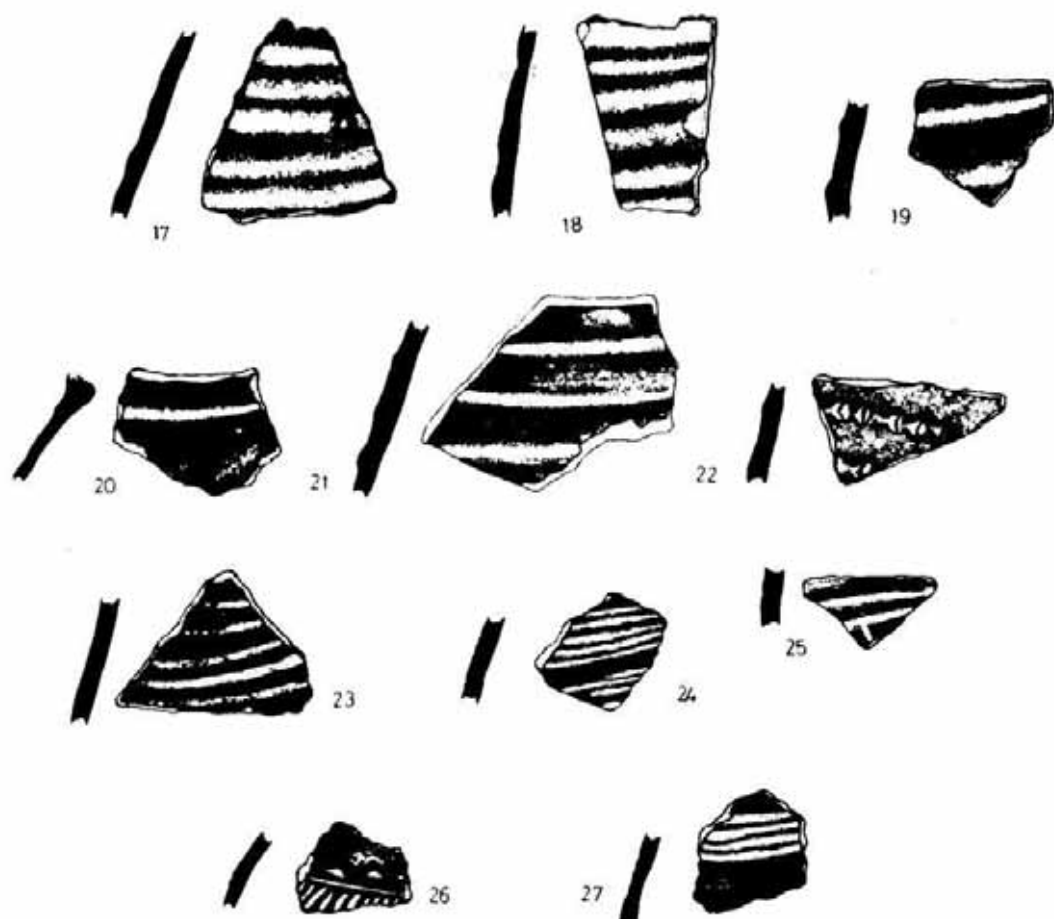


FIG. 13. *Datrana IV: chalcolithic pottery*

Overlying the Mesolithic deposit is the Chalcolithic blade industry debitage having a thickness of 30 to 40 cm. There is, however, no stratigraphic break between the two. As a result, at a certain level, both Chalcolithic and Mesolithic deposits are slightly mixed stratigraphically. Whether or not this is due to the survival of the Mesolithic community at the site is not easy to ascertain. It is almost certain that throughout its existence the site remained an important factory site for lithic tool production.

The Chalcolithic deposit was characterized by preponderance of long blades, predominantly made on fine chalcedony, by using the crested ridge method of blade production. The industry incorporated hundreds of crested ridge blades and crested ridge cores of different sizes (fig. 11). Diagnostic artefacts in the collection included different types of backed-blades, points, truncated blades, large crescents, burins and simple long blades. Some of the blades show a very heavy inverse retouch. In addition to chalcedony, different types of agate, jasper and chert were also used as raw material for making lithic tools by the Chalcolithic stone knappers.

In the excavation was found a small copper/bronze punch point which might have been used for blade production. This is a small squarish prism-like tool measuring 2.8 cm long and 0.5 cm thick at the broad end. This broad end was rounded to a blunt point and the other end tapers from all four sides to a rather sharp point. The broad blunt end was used as the working end after hafting the tool on to a handle like a punch, and could be used in the removal of blades by indirect punch and hammer or pressure flaking method.

In addition to the above blade and flake artefacts, the stone knappers at Datrana, it appears, had tried their hand on bead making too. A few cylindrical and small disc-like bead rough-outs of carnelian with perforation, and a few with tell-tale marks of attempted perforation, small tanged chert drill-bits and sub-cylindrical drill-points of banded agate like the ones found at Chanhudaro, Shahr-i-Sokhta, and Nagwada bespeak such attempts. However, bad workmanship and clumsiness of these beads may leave behind a feeling that these were attempted by non-professionals.

The Chalcolithic deposit included some sherds of pottery too. It is interesting to note that, apart from a few sherds of the typical north Gujarat regional pottery like the gritty red ware, fine red ware and burnished red ware, the ceramic assemblage at the site included a few unique wares like the burnished grey ware and a burnished coarse grey ware with a thick grey/black slip (figs. 12-13). The vessels were hand-made and show panels of thick, obliquely impressed lines all over the body, set in between two lines of similar character. These incised/impressed lines were drawn on the burnished surface of the pot by using a smooth rod with a blunt, flat end. A few black-and-red ware sherds showing a similar decorative feature at the rim and distinct shapes are also part of this assemblage (fig. 12). Besides these, there is also found a type of red ware with a corrugated/ribbed surface.

A large number of animal bones, antlers, teeth and fish vertebrae were collected from this deposit. Cattle, sheep/goat, antelope and pig were the important animals identified in the collection.

30. EXPLORATION IN DISTRICT BANASKANTHA. — V.S. Parekh, V.H. Sonawane, P. Ajith Prasad and P.C. Choudhary of the Department of Archaeology, M.S. University, Baroda, carried out further exploration in District Banaskantha and located twelve new Harappan-affiliated Chalcolithic sites. A

majority of these sites are located in Radhanpur taluk within a radius of 6 to 8 km from Santhli village. All these sites are rural settlements of the Harappa culture mostly belonging to the post-urban phase. A few, however, showed the gritty red ware of the regional Chalcolithic tradition and even the burial pottery retrieved from Nagwada and Santhli showing resemblance with the pre/early Harappan pottery of Sind. A list of the sites discovered during the exploration is given below.

<i>Taluk</i>	<i>Site</i>	<i>Village</i>	<i>Nature of remains</i>
Radhanpur	Bajaniya no Thumdo (Koliwada-III (40 x 30 cm)		Microliths and Chalcolithic
-do-	Haiduk no Thumdo I (Santhli-VI) (60 X 50 cm)		Mesolithic and Chalcolithic
-do-	Haiduk no Thumdo II (Dehisar II) (60 X 40 m)	Dehisar (23° 56'N; 71° 31'E)	Late Harappan
-do-	Indranagar no Thumdo (20 X 10 m)	Indranagar (23° 53'N; 71° 35'E)	Chalcolithic
-do-	Javantri (20 X 10 m)	Javantri (23° 54'N; 71° 33'E)	Chalcolithic
	Kalatalavdi no Thumdo (Santhli-V) (60 X 50 m)		Mesolithic and Chalcolithic
-do-	Navod no Thumdo (Santhli-IV) (10 X 10m)		Microlithic and Chalcolithic
-do-	Shiharu no Thumdo (Koliwada-II) (100 x 30 m)	Koliwada (23° 51'N; 71° 30'E)	Late Harappan and regional Chalcolithic pottery
-do-	Vajiyasri no Thumdo (Santhli-III) (21 x 10 m)	Santhli (23 ° 54'N; 71°29'E)	Microliths and late Harappan
Santalpur	Bhamaria Thumdo (Jhandada-IH)	Jhandada (23° 56' N; 71° 27' E)	Chalcolithic

EXPLORATIONS AND EXCAVATIONS

<i>Taluk</i>	<i>Site</i>	<i>Village</i>	<i>Nature of remains</i>
Suigam	Jakhra Pir-no-Thumdo (Suigam-H) (100 X 70 m)	Suigam (24°07'N; 71 °20'E)	Microliths and Chalcolithic
-do-	Limbuni-no-Ghod (Suigam-I) (30 x 30 m)	Limbuni (24° 09'N; 71° 20'E)	Microliths and Chalcolithic

31. EXPLORATION IN DISTRICT BANASKANTHA. — During the course of his exploration under village-to-village survey scheme, Vilas Jadhav of the Vadodara Circle of the Survey brought to light the following sites of archaeological interest.

<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Disa	Bhatsan	Sculptures of Durga, Siva-Parvati, medieval period
-do-	Hanumanpura	Sculpture of Jaina Tirthankara, medieval period
-do-	Lorwada	Sculptures of Ganesa, Durga, Siva, medieval period
-do-	Malgad	Mircroliths
-do-	Rasana	Sculptures of Vishnu, Siva, Bhairava, medieval period
^io-	Samadi	Remains of Siva temple, medieval period
-do-	Velaval	Sculptures of Ganesa and Brahma, medieval period
-do-	Wadawal	Late medieval habitation
Kankarej	Fategad	Sculptures of Ganesa, Siva, Durga, <i>apsara</i> , medieval period
-do-	Jamuna-Padar	Medieval habitation site
-do-	Raner	Sculptures of Ganesa, Vishnu, Siva, medieval period

32. EXPLORATION IN SUBMERGENCE AREA UNDER SARDAR SAROVAR PROJECT, DISTRICTS BHARUCH AND VADODARA. — The Excavation Branch V, Vadodara, of the Survey under the direction of G.T. Shendey, assisted by Y.S. Rawat, V.H. Parmar, N.B. Soni, J.B. Makwana, K.R. Malviya, S.B. Parmar and K. Bahuleyan, explored the submergence area under the Sardar Sarover Project falling under Nandod taluk of District Bharuch and Chhotaudepur and Naswadi taluks of District Vadodara. The main objective of the work was to ascertain archaeological potentiality of the area. In the course of exploration, one medieval site and six microlithic sites were located (fig. 14). It was observed that most of the microlithic localities are situated along the small rivulet on a hill slope or on a terrace and all are open-air surface sites. The microlithic assemblage include mostly simple lunates, retouched blades and flakes, fluted core, worked nodules and other debitage (pi. II). Locally available chalcedony seems to be used as raw material for making artefacts. Occasional use of chert was also noticed. The exploration brought to light the following sites.

<i>Taluk/District</i>	<i>Site/Village</i>	<i>Nature of remains</i>
Nandod Bharuch	Jher-2 (21° 52'N; 73° 46'E)	Microliths
-do-	Panchmuli (21° 52'N; 73° 45'E)	Microliths
Chhotaudepur, Vadodara	Devdi (21° 57 N; 74° 05'E)	Microliths
-do-	Hap (21° 57 N; 74° 07'E)	Medieval
-do-	Turkhera (21° 56'N; 74° 05'E)	Microliths
Naswadi Vadodara	Antras (21° 54'N; 73° 56'E)	Microliths
-do-	Kodada (21° 55' N; 73° 00'E)	Microliths

33. EXCAVATION AT PADRI, DISTRICT BHAVNAGAR. — The excavation at Padri was continued for the fourth consecutive year by Vasant Shinde with the assistance of S. Rokde, V.G. Gawade, V.C. Kamble, S. Kadgaonkar, P. Kirloskar, J. Fernandes and K. Malap of the Deccan College Post-graduate and Research Institute, Pune. It was for the first time in Saurashtra that such a stratified pre-Harappan phase was discovered. In order to know the life-style of these early settlers and their contribution to the making up of the Harappan culture in Saurashtra (Sorath Harappan termed by G.H. Possehl), it was decided to excavate this phase horizontally in the central place where the early historic and Harappan

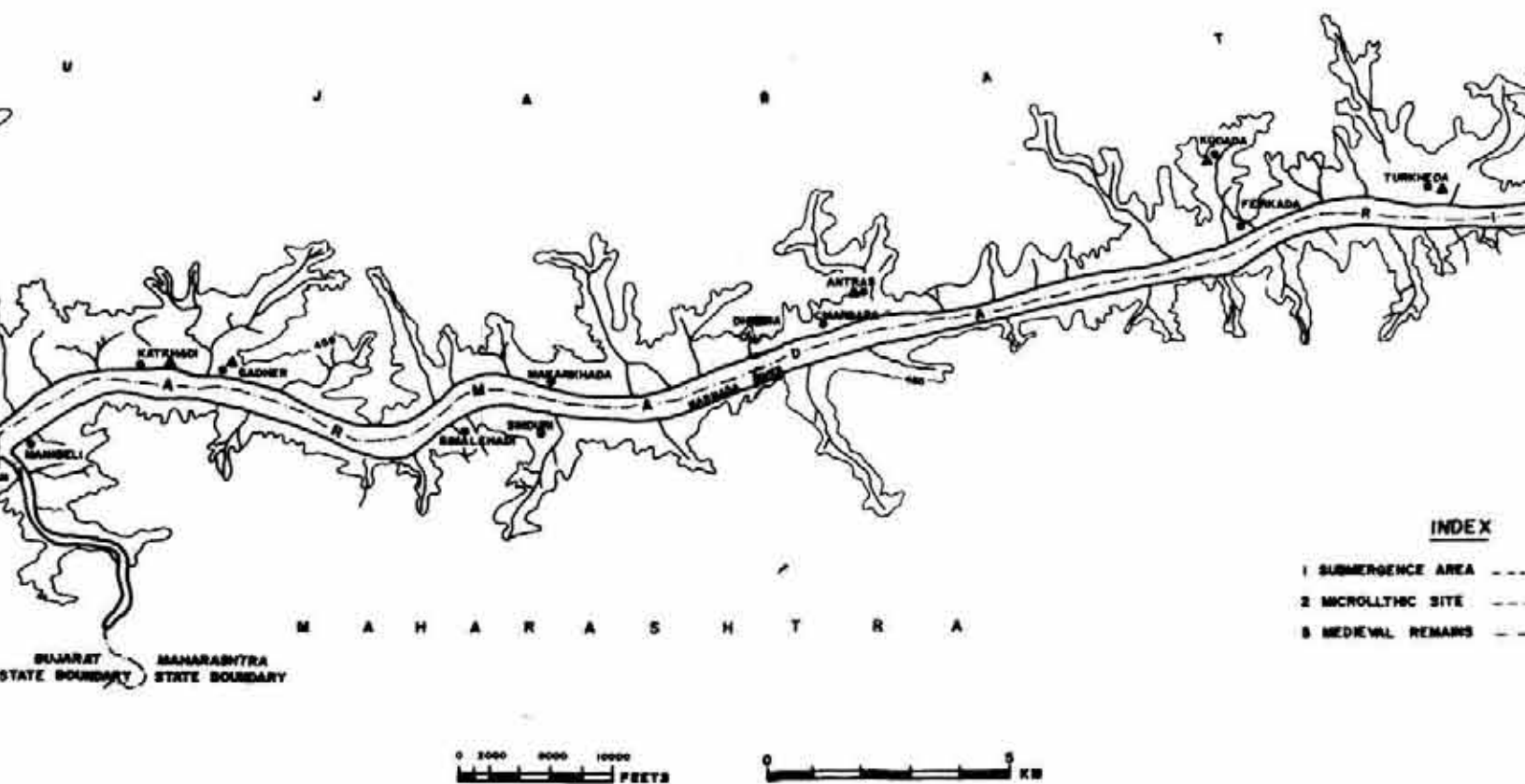
levels were unearthed in previous seasons (1991-92, pp. 21 -22). The digging was carried out in this area in six (5x5 m) trenches. In order to ascertain the extent of the Harappan and pre-Harappan occupations within the site, it was decided to dig down to the virgin level in the eastern half of TTE-A1, an index trench located on the eastern periphery of the mound. A huge structure-complex (pl. II1A) (14-A to I) with nine rooms of varied functions, either rectangular or squarish in plan, was uncovered in the pre-Harappan level. All these rooms were interconnected by some common wall. The structure was exposed in an area of 12.5 m (east-west) X 12.5 m (north-south), which continued still further on all the directions suggesting a huge structural complex originally.

Room (14A), situated in the northwestern corner of the structural complex was squarish, measuring 6-70m (east-west) by 6-20 m (north-south). Its southern and eastern walls were made of mud-bricks (34 X 16 X 8 cm), whereas the northern one was made of brown clay. This room contained in its western half two circular stone platforms, one complete and the other broken by a later pit, possibly meant for supporting storage bins, and a couple of complete storage jars of coarser variety. Another, small room (14 B), located on the eastern side of room (14 A), measured 3.60 m (north-south) X 1.60m (east-west). This narrow chamber may have been apart of room (14 A) as there was an opening between the two. In the absence of any other domestic activities, they could be identified as the storage rooms in the complex.

Another rectangular room (14 C), located on the eastern side of room 14 B, measured 3-40 m (north-south) x 2-07 m (east-west). It contained a semicircular mud-platform (dia 1.72 m, 10 cm high) in its northeastern corner and a circular fire-place (dia 72 cm) almost in the centre along the southern wall. Two large but thin copper fish-hooks and a solid chisel were found in this room. Considering the concentration of copper artefacts and the provision of the circular fire-place, possibly meant for copper working, this room was occupied by a coppersmith. The mud-platform found in this room perhaps served as coppersmith's working place. Room 14 D, located to the eastern side of room 14 C, has measured 3.50 m (north-south) and the exposed east-west portion 2-10 m. It extends to the eastern undug section, which has yielded one complete jar of coarse variety.

There were two rooms (14 G and 14 H) on the southern side of rooms 14 C and 14 D, rectangular in plan, but much disturbed in the southern side. One of the rooms (14 G) yielded most of the small blade tools and debitage found in this level, whereas the other, located on its east, had a small fire-place represented by two small stones and a circular burnt patch. These two rooms can be associated with blade tool manufacture. The fire-place was perhaps used for roasting raw material of chalcedony in order to facilitate flaking. Rooms 14 E and 14 F, divided by a small partition wall and located on the southern side of 14 B contained small circular fire-pit along the southern margin. The former was rectangular in plan, measuring 3.65 m (east-west) and 1.90 m (north-south). In case of the latter the exact north-south dimension could not be measured as it extended further. It was exposed over an area of 5 m (north-south) X 3.90 m (east-west). Both these rooms had well-made floor of alternate layers of brown silt and *murram*, rammed hard and plastered with cow dung. Considering the nature of the floor and the presence of the fire pit, the same could be identified as a kitchen. Possibly, there was one more storage

EXPLORATION IN SUBMERGENCE AREA UNDER SARDAR SAROVAR PROJECT DISTT. VADODARA & BHARUCH (GUJARAT)



room on the western side of room 14 F where a circular stone platform was discovered. By the side of this stone platform were found thick potsherds arranged in a circular fashion, which was clearly a base of the later (Harappan) pit-silo.

The huge structural complex, which extended in all the directions in the unexposed sections, was still bigger in size. In the exposed area, nine rooms of varied functions were exposed. On the basis of alignment of some rooms, varied thickness of walls and the kind of raw material used for the construction of walls, the structural complex appeared to have different constructional phases. The rooms 14 A and 14 B, slightly lower in level and having walls of uniform material (mud-bricks in the ratio of very close to 4 : 2 : 1 and mud) were constructed in a perfect alignment. In the second phase, two long parallel walls of black, sticky clay running north-south were added to the complex on the southern side. To these walls were added a number of walls in the east-west direction to form different rooms. The compartments added subsequently are slightly out of alignment with the original plan. The entire complex may have been used for storage and workshop. This is the only pre-Harappan site in Gujarat which revealed this evidence. This phase has been dated between c. 3600 and 3300 BC (calibrated).

When this phase was discovered in a small dig (5 X 5 m) carried out earlier, it was thought to be the pre-Harappan mainly because of its stratigraphical position and the nature of painted ceramic assemblage associated with it. However, the evidence gathered from the horizontal excavation carried out this season indicates a cultural transformation from the earliest occupation to the mature phase of the Harappan culture. It is, therefore, justifiable to term the earliest phase as the early Harappan. The transformation is seen mainly in their painted ceramics. The coarse and slightly crude, ill-fired and haphazardly painted pottery found to be associated with the early phase gradually becomes refined in the ascending order and in the uppermost levels it is almost transformed into the Harappan painted ware. Some of the phases like a stud-handled bowl, dish-on-stand, perforated jar and goblet occur in the early Harappan phase, and continued to be the characteristic pottery types in the succeeding mature phase. Besides, the occurrence of mud-bricks almost in the ratio of 4 : 2 : 1, the Harappan signs engraved on the early Harappan potsherds, copper objects stylistically similar to those found in the mature Harappan phase, etc., suggest that the early phase gradually developed into the mature one at the site.

34. EXPLORATION IN DISTRICT KACHCHH. — In the course of exploration of forty-six villages in Abdasa, Lakhapat and Nakhatrana taluks, Vilas Jadhav, S.S. Parekh and K.P. Mohandas of the Vadodara Circle of the Survey, brought to light nineteen sites bearing antiquarian remains which are as under.

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Abdasa	Aida	Medieval red ware
-do-	Akri Moti	Sherds of red ware, black painted red ware, terracotta and stone objects of medieval period
-do-	Gholae	Medieval pottery

EXPLORATIONS AND EXCAVATIONS

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Abdasa	Hothi	Medieval potsherds mainly black-on-red ware pottery
-do-	Makada	<i>Chhatri</i> and hero-stones of medieval period
-do-	Moti Ber	<i>Chhatri</i> and hero-stone of late medieval period
-do-	Padar Wadi	Early medieval pottery
-do-	Thumri	Pottery mainly painted red ware; terracotta object of medieval period
-do-	Wadasar	Thirteen <i>chhatris</i> and temple of late medieval period
Lakhapat	Bhitali	Cores (of microliths) Late medieval
-do-	Guner	pottery Hero-stones of late medieval
-do-	Jara	period
-do-	Kora	Cores (of microliths); copper coin and pottery of medieval period
-do-	Lakhapur	Siva temple (fifteenth-sixteenth century)
-do-	Nara	Five hero-stones and fort of late medieval period; two sculptures of <i>dvarapala</i> ; sculptures of Bhairava, Mahishasuramardini and two elephants at the entrance of the fort
-do-	Umrasan	Microliths, factory site of microliths and siliceous stones
Nakhatrana	Ludbay	Late medieval pottery
	Mum	Microliths, late Harappan pottery; temple remains and three hero-stones of late medieval period
-do-	Walka	Pottery of late medieval period

35. EXCAVATION AT ROJDI, DISTRICT RAJKOT. — Excavation at Rojdi in the Gondal taluk of District Rajkot was continued by the Directorate of Archaeology, Government of Gujarat in collaboration with the University Museum, University of Pennsylvania, USA in the southern periphery of the main mound. The structural finds include circular thrashing or pounding platforms while further clearance of the fortification wall also revealed several courses. It seems that the fortification did exist during the earlier period but assumed greater importance later in the Harappan times. Other finds include beads of various materials like agate, carnelian, terracotta and paste. The late Harappan pottery types include jars of various sizes, smaller pots, dishes and dishes-on-stand and carved bowls. On one of the potsherds occur a human figure, holding a bow and an arrow, painted in black on red. Among other important finds, three copper celts (14.4 X 0.7 cm) are noteworthy.

36. EXCAVATION AT HAP, DISTRICT VADODARA. — The Excavation Branch V, Vadodara, of the Survey under the direction of G.T. Shendey assisted by Y.S. Rawat, V.H. Parmar, N.B. Soni, J.B. Makwana, K.R. Malviya and S.B. Parmar undertook salvage operation at Hap in Chhotaudepur taluk. The objective of this operation was to know cultural sequence and structural details of the site - the remains of which will perish after completion of the Sardar Sarovar Project. Locally known as the site of old Hapeshwer temple, it is situated behind the present temple on a small hillock. Investigations made at the site revealed remains of a small medieval fortification measuring 110.60 m NS and 75.60 m EW in dimension. Trial excavations conducted at five different points confirmed that the settlers selected the top of a small isolated hillock for their settlement and raised there a wide fortification (1.90 m to 2 m) along the periphery at the top. The fort was polygonal in shape with a rectangular side towards south. The southern fort-wall was the longest, measuring 75-60 m with an extant height of 2 m including 1 m in foundation trench in a small cutting (fig. 15). At the south-eastern corner of the fortification, traces of a semicircular bastion, which was provided from the exterior (pl. III B) were noticed. Only one cultural stratum underlying the debris yielded a few potsherds (fig. 16). The average thickness of this deposit was 0-20 m to 0-30 m indicating a very short duration of the settlement. This evidence corroborates the history of the area as there are references to one of the Chauhan princes of Pavagadh who took refuge at Hap for a short period after he was defeated by Mahmud Begada of Ahmedabad in AD 1484.

37. EXPLORATION IN THE SUKHI VALLEY, DISTRICT VADODARA. — As a part of the Prehistoric and Palaeo-environmental research project sponsored by the Ford Foundation Grant to the Department of Archaeology, M.S. University of Baroda, P. Ajith Prasad assisted by P.C. Choudhary along with students, in continuation of the last year's work {1992-93, pp.32-34}, carried out further exploration in the Sukhi valley. The exploration was conducted with a view to tracing the extension of the Acheulian culture and for understanding the developmental features of the Acheulian into the Middle Palaeolithic culture.

The exploration resulted into the discovery of a few more Acheulian and Early Middle Palaeolithic sites in two distinctive geomorphic contexts: (a) in the piedmont of the northern escarpment of the valley, and (b) on top of the high hills. As reported earlier, in the piedmont, the Acheulian localities are found in the earliest Quaternary formation (Narvaniya formation) at Bar, Tikawada and

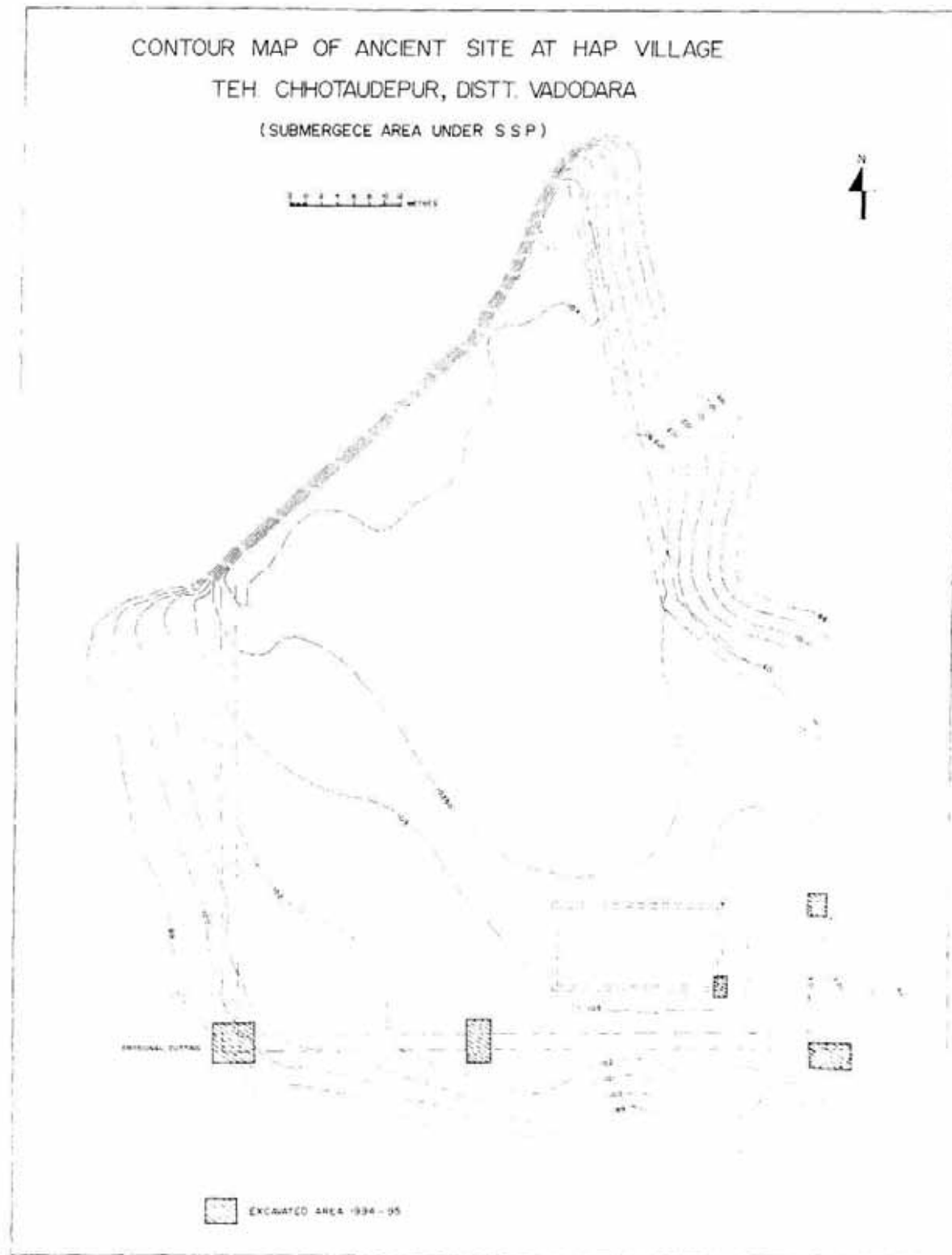


FIG. 15.

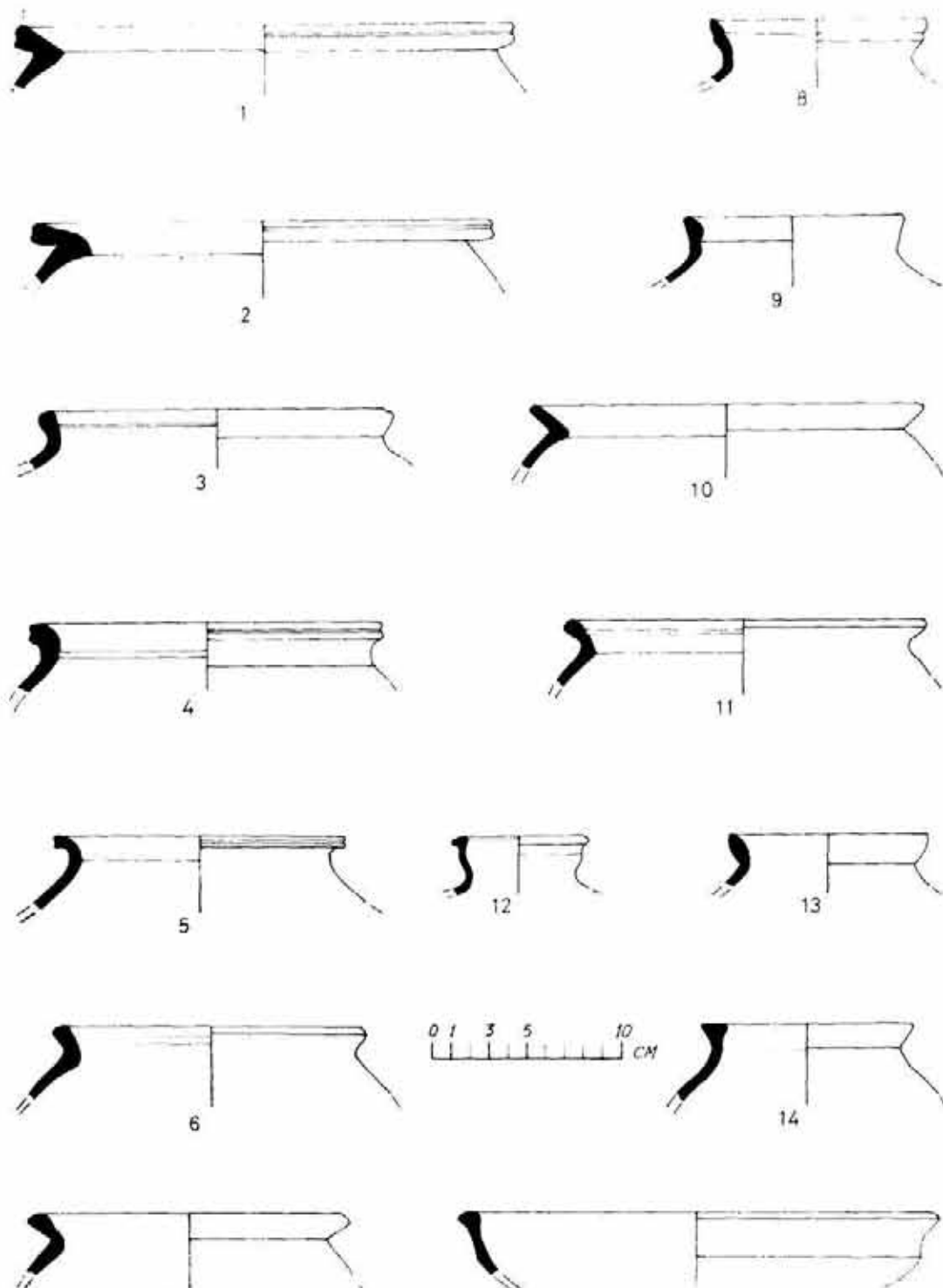


FIG. 16. Hap: pottery types

EXPLORATIONS AND EXCAVATIONS

Vasantgarh villages along with cobbles and gravels of different sizes. At a few sites, they were found resting JUS! over the basal granite bed-rock mixed with disintegrated granite and a whitish grey clay deposit.

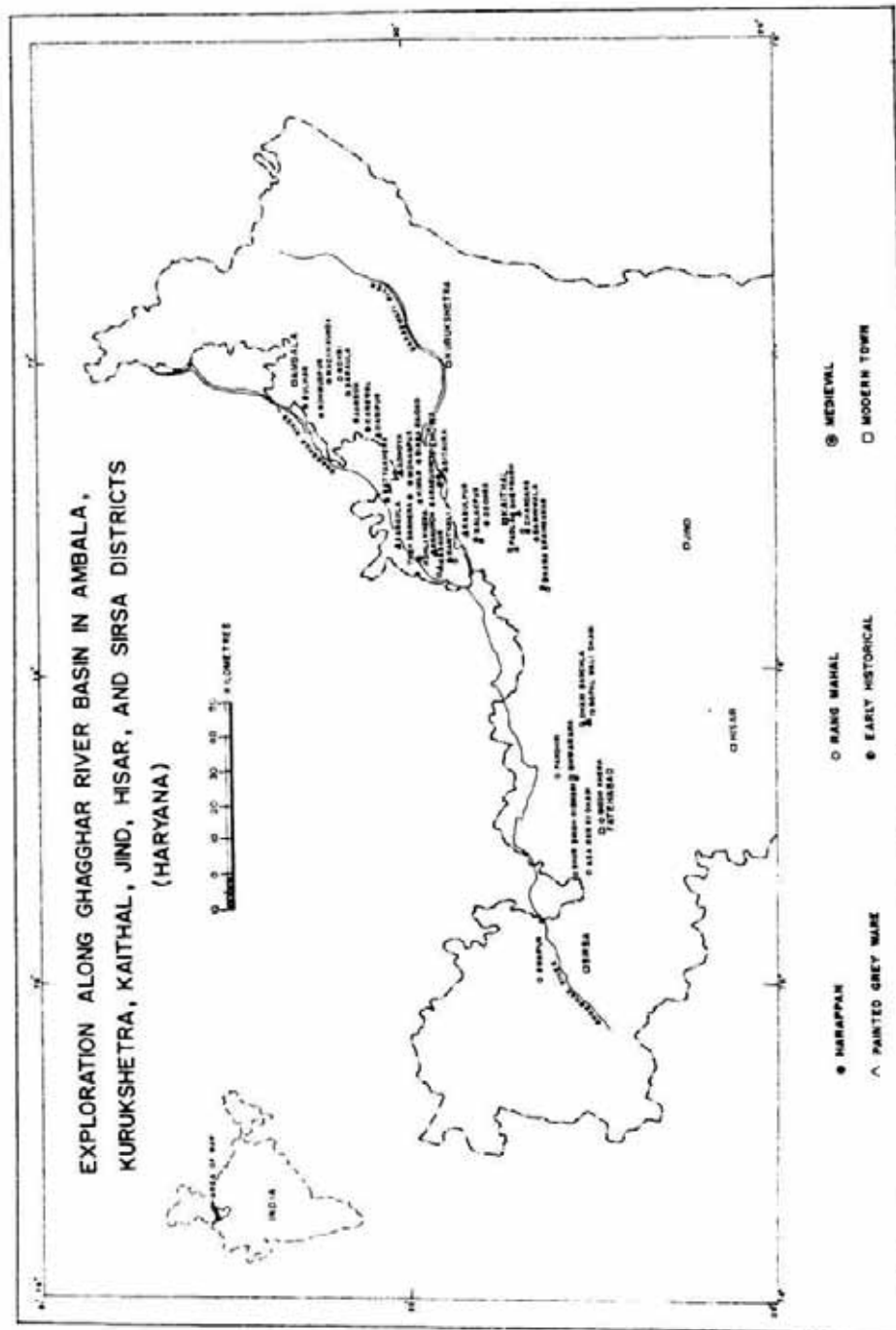
In the second context, a number of Acheulian and Early Middle Palaeolithic localities were located on the top of the high hills at Kevada, Pani and Jogpura villages. These hills are in fact, erosional remnants of the original tableland. From Bar, it stretches about 10 km towards the west with a maximum height of 350 m from the ground. Thousands of years of constant weathering and erosion have turned this tableland into a landscape having an amphitheatre-like morphology, with deep gullies, prominent rock promontories and relatively flat plains. The Acheulian and the Early Middle Palaeolithic sites on this flat land and gentle slopes at a height of 250 to 350 m were located as continuous spread of artefacts having discrete clusters indicating their depositional nature.

Because of the above geographic context these Acheulian sites are in a good state of preservation and show a rich accumulation of artefacts in a relatively undisturbed condition. Acheulian artefacts collected from these localities include typical tools like the handaxes, cleavers, scrapers, chopping tools and knives along with the debitage of the Acheulian industry. Artefacts from a few selected localities were collected systematically by following a grid plan after taking into consideration the nature of the surface spread. Relative position and other features of the artefacts were recorded in a facsimile of the grid plan. At a few localities, we came across abraded artefacts made on large flakes. Similar abraded tools, associated with fresh Acheulian artefacts, were also collected from the Narvaniya formation in the pediment sites. The occurrence of the abraded artefacts on the top of the hills possibly indicate a very early deposition. That many of these abraded artefacts were later reused after further flaking and chipping by the later Acheulians is evident from the relative freshness and differential patina on the later flaked surface.

The Early Middle Palaeolithic sites on these hill tops show a similar depositional feature. At a few sites, both the Acheulian and the Early Middle Palaeolithic artefacts were found fixed on the surface. Artefacts of this period include miniature handaxes and cleavers and a variety of small scrapers made on Levallois flakes.

In addition to the Acheulian sites a number of Mesolithic sites, a few of them in granite caves and rock-shelters, were located during the exploration at Palsinda, Tikawada, Vasantgarh and Ambhakut villages. Caves at Palsinda and Ambhakut have prehistoric paintings showing simple geometric designs and human figures drawn in red ochre. Among these the cave at Ambhakut is reasonably large having a 5 m deep gallery and 8 m wide opening with a substantial occupational deposit. A number of geometric and non-geometric tools like lunates, triangles, points, various types of backed-blades and retouched-flakes along with the debitage of microlithic industry and pieces of flat sandstone slabs or "palette stones" are the artefacts collected from these Mesolithic sites.

Besides, a number of soil and sedimentary samples were also collected from various Acheulian and Mesolithic sites and from stratified contexts like river and stream sections and newly dug up well sections in the piedmont.



HARYANA

38. EXPLORATION AROUND GHAGGAR RIVER, DISTRICTS AMBALA, KURUKSHETRA, KAITHAL, JIND AND SIRSA. — B.R. Meena assisted by P.K. Mishra, Jasmer Singh, Vinod Kumar, Baldev Singh, Gauri Dutt of the Chandigarh Circle of the Survey, conducted exploration from Sirsa to Ambala around the Ghaggar river (pl. V) in Haryana. An area of 6000 sq km covering the Districts of Ambala, Jind, Kaithal, Kurukshetra and Sirsa was explored (fig. 17). The list of sites ranging from the Harappan to the medieval periods (fig. 18) is as under.

<i>District</i>	<i>Tehsil</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Ambala	Ambala	Baraula	Rangmahal; medieval pottery
-do-	-do-	Danipur	PGW
-do-	-do-	Jansua	Medieval pottery
-do-	-do-	Kangwal	Medieval pottery
-do-	-do-	Machhaunda	Medieval pottery
-do-	-do-	Mohri	Rangmahal; medieval pottery
-do-	-do-	Mohudpur	Rangmahal; medieval pottery
-do-	-do-	Sulhar	Medieval pottery
Hissar	Fatehabad	Asa Ram Ki Dhani (Gahla Khera)	Rangmahal pottery
-do-	-do-	Bhirarana (mound 1)	Rangmahal pottery
-do-	-do-	Bhirarana (mound 2)	Rangmahal pottery
-do-	-do-	Bhur Singh Ki Dhani (Karnauli)	Rangmahal pottery
-do-	-do-	Dhani Sanchla	PGW
-do-	-do-	Gopal Wali Dhani	Rangmahal; medieval pottery
-do-	-do-	Modh Khera	Rangmahal: medieval pottery
-do-	-do-	Pandhri (Palsar)	Rangmahal pottery
Jind	Narwana	Bhana Brahmanan	Rangmahal; medieval pottery
Kaithal	Gula	Adhoya	Rangmahal; medieval pottery
-do-	-do-	Kasaur I	Rangmahal; medieval pottery
-do-	-do-	Kasaur II	PGW; Black-slipped and early historical pottery
-do-	-do-	Kohli Khera	Medieval potter)'
-do-	-do-	Ramthali	Rangmahal; medieval pottery

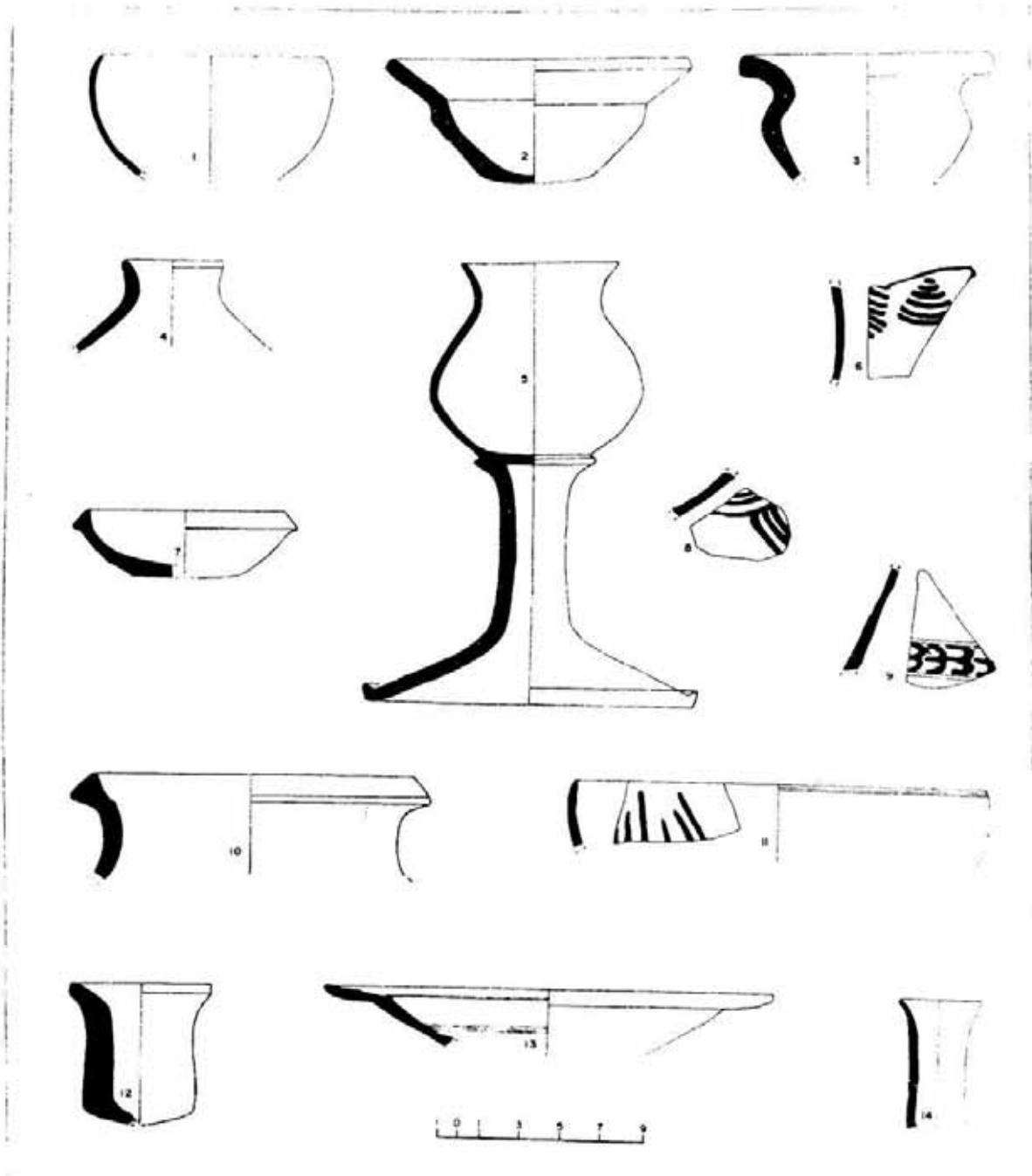


FIG. 18. Kanthi, Kurukshetra, Sirsa and Hissar: shapes in PGW and Rangmahar pottery

EXPLORATIONS AND EXCAVATIONS

<i>District</i>	<i>Tehsil</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Kaithal	Gula	Ratta Khera (Kuhram)	Harappan pottery
-do-	-do-	Riwar	Medieval pottery
-do-	-do-	Saraula	Harappan; PGW and Black-slipped pottery
-do-	Kaithal	Bamniwala	Medieval pottery
-do-	-do-	Chandana	Medieval pottery
-do-	-do-	Deohra	Medieval pottery
-do-	-do-	Malakpur I	Harappan pottery
-do-	-do-	Malakpur II	Medieval pottery
-do-	-do-	Padla I	Rangmahal pottery
-do-	-do-	II Rasulpur	PGW
-do-	-do-	Shergarh (Sirkat) mound 1	Early historical; Kushan (pl. IV B-C) and medieval
-do-	-do-	Shergarh mound 2	PGW
Kurukshetra	Pehowa	Mohanpur Sataura	Medieval pottery
-do-	-do-	Sataura I	PGW
-do-	-do-	Sataura II	Harappan and PGW (pl. IV A)
-do-	-do-	Siana Saidan	Medieval pottery
-do-	-do-	Theh Barasaun	Medieval pottery
Sirsa	Sirsa	Swaipur	Rangmahal pottery

39. EXCAVATION AT KUNAL DISTRICT HISSAR.— In continuation of previous year's work (1991-92, pp. 37-39), excavation at Kunal in Ratia tehsil was undertaken by the Department of Archaeology and Museums, Government of Haryana. under the direction of J.S. Khatri assisted by M. Acharya. R.S. Dahiya, Ranvir Shatri, Kali Ram, S.P. Chalia, Vinod Gupta, Darbar Singh, Anand Parkash and Roshan Lai.

The site (19°30' N; 75° 41' E). 12 km west of Bhuna town, is spread over an area of 3 acres and lies on the left bank of the river Sarasvati. This river starts from Adi Badri, District Yamuna Nagar and flows past Kurukshetra-Thanesar, Arnai (Aruna-Sarasvati Sangama), Pehowa (Prithudaka), Bahirakesha (Bahar), Sirsa (Sairishika), etc., and famous archaeological sites of Bhagwanpura. Banawali, etc., all of which are ancient sites. Near Tohana, it was captured by the Ghaggar and Joia Nalah or Rangoi is a palaeochannel of the Sarasvati on which archaeological site is located.

Excavation at Kunal has brought to light three successive phases of pre-Harappan culture. In the initial occupation at the site (2 X 1.10 m), there dug up large pits over which were raised wattle-and-daub huts for dwelling. The conical superstructures of wood and grass were made over the pits for protection against extreme weather. A few post-holes were also noticed around one of these dwelling pits. Presence of a hearth in every such pit and adjoining refuse pit also proves this hypothesis that those were used for dwelling. The ground level of the site was artificially raised with a red coloured cement-like clay in order to protect the huts against flood. This clay deposit is found throughout the site with a maximum deposit of 0-71 m. At least, four dwelling pits along with their refuse pits were exposed in the excavation.

The people of this phase domesticated animals and practised agriculture. Although they used wheel for making pottery but the ceramics were mostly hand-made. No prominent pre-Harappan pottery of Kalibangan type could be noticed during this phase. Apart from the wheel-made bichrome red and other wares, the hand-made black and red wares, and Hakra type red ware pottery with wavy incised designs on the outer surface are important. Painted motifs like horned-deity and diamond-shaped criss-cross designs in monochrome or bichrome were very popular.

Antiquities included bone tools and micro blades of chalcedony. Copper is represented by arrow-heads and fish-hooks. The earliest deposit found here is unique of its kind as no site in India has so far yielded such evidence related to the chalcolithic cultures.

The second phase is characterized by the occurrence of moulded mud-bricks which were initially used for lining the dwelling pits.

At least, three such pits (Circular structures I, II and III) with outer dia 2-92 m, 2-64 m and 2-75 m respectively were exposed. Circular structure I and II contained five mud-brick courses, each with a height of 1-37 m and 1-17 m. Circular structure III comprised two brick courses. Significantly, the brick size of these structures do not fall in the traditional pre-Harappan or Harappan brick ratio, which are 11 X 24 X 39, 10 X 22 X 37 and 11 X 23 X 38 cm. Two fine brick-lined hearths were also found inside the Circular structure III. This second phase of Kunal is comparatively advanced from that of the earlier and is characterized by the occurrence of the Kalibangan pre-Harappan fabrics along with the earlier pottery of Kunal.

In the third phase, square and rectangular rooms including those for kitchen and toilet were unearthed. At this stage, the ground was artificially raised for supporting such buildings. Interestingly, the sizes (9 X 18 X 36, 11 X 22 X 44 and 13 X 20 X 39, 11 X 22 X 33 cm) of bricks were found to be highly standardized (with a ratio of 1: 2 : 4 and 1: 2: 3). To drain out the water from houses a sanitary jar or a soakage pit was placed or dug out in the street. The waste material was dumped in refuse pits only. For storing agricultural produce, the people used corn silos of different sizes. Some of them are found carefully lined with clay. Antiquities like arrow-head of copper, bone points and blade, beads of terracotta, steatite, faience, lapis-lazuli remained in use right from the earliest phase. Beads of agate and copper, blades of chert and a spear-head of copper were also found during this phase.

The use of pottery also increased comparatively and forms diversified. The paintings were strictly geometrical in bichrome colour with the predominant use of black and white. The shapes included vases of different sizes, jars, bowls, basins and troughs, dishes, dishes-on-stand. etc. All the pre-Harappan fabrics found at Kalibangan are duly present in the assemblage. Most interestingly, the black-and-red ware, distinctive red ware, grey ware painted with tan red and cream white (different from fabric F of Kalibangan), black painted red ware, with paintings occur inside the rim which cover more than half portion of outer body. Four types of engraved pottery (including the Hakra ware type) are present at Kunal all through. It is also important to note that a medium-sized kiln for making pottery and bricks was also noticed in this phase.

Further, a water-channel (4.15 m wide and 3.45 m deep) running north-south was traced along some part of the eastern edge of the habitation mound, for a length of 21 -20 m only.

The pre-Harappan pottery of Kunal is notable for its fanciful shapes and designs. The pots are in different shades of red and buff, beautifully painted with black and white colours. Painted designs are mainly geometrical but a few sherds with animal and bird motifs such as bull, deer, horse, peacock, crane, etc., and natural designs like *peepal* and other leaves, flowers, etc. are also available. A variety of horned-deity was found most frequently. There was impression of cloth besides graffiti marks on the pottery reported from all the three phases of the site. Graffiti marks are engraved mostly on the pot after firing. Popular graffiti signs could be classified in three distinct groups such as the Harappan sign, geometrical patterns and pictorial designs.

Besides shell bangles, the use of semiprecious stones like carnelian, steatite, lapis-lazuli, agate, etc., for ornaments increased along with the continuation of copper and bone implements. An antler was found for the first time from this phase.

One of the most important contributions of this site is the discovery of steatite seals from the pre-Harappan level. Occurrence of two steatite and a shell seal during this excavation in addition to the four steatite seals found in the previous excavations proves that these are the earliest examples of seal manufacturing technique in India. Motifs engraved on these seals are quite different from the known Harappan ones. The geometrical patterns are, however, common to the motifs painted on the pottery. The Harappan script is conspicuous by its absence.

Noteworthy antiquities consisted of two crowns, armlet, bangles, beads and one necklace made of eleven disc-shaped beads, two terminals with loops which are highly corroded, all made of silver; more than twelve thousand beads of semiprecious stones and gold pendants. Discovery of a large number of beads of semiprecious stones and ornaments of gold and silver is also noteworthy. Gold pieces include six disc-shaped beads, three tubular beads and two small bowl-shaped beads of a necklace weighing about 35 gm. Twelve thousand four hundred and forty-five beads of semiprecious stones comprise three thousand three hundred and seventy carnelian, two thousand eight hundred and six steatite, five thousand six hundred and ninety lapis lazuli, and four hundred eighty-seven shell and ninety-two agate ones.

Pollen samples for determining the palaeo-environmental conditions suggest that the area of Kunal was once covered with mesophytic vegetation which seemingly belong to various families of flowering plants such as *nymphaea*, *crucifera*, *polygeriacea*, *amranthaceae*, *chenopodiaceae*, *compositae*, *buttulaceae*, *protiaceae*, *mimosidae*, *myrsinaceae*, *sapolaceae*, *oleaceae*, *labiatae* and *ericaceae*. The long distance wind-borne pollen of pines were also noticed.

On the other hand, in the initial stage of observation during recovery of ancient botanical remains, K.S. Sarswat of Birbal Sahni Institute of Palaeobotany, Lucknow, found that the settlers were of farming community. So far, wheat, barley, pea, lentil, *mung* and oleiferous sesame (*til*) seeds indicate the rotation of crops in the year (winter and summer crop). There was presence of rice, as evidenced by the impression of its husk on pottery. On the basis of botanical evidence the past climatic conditions of Kunal appears to be wet.

The discovery of these seals, ornaments and a large number of the pre-Harappan pottery of diverse types in the Sarasvati valley proves that the pre-Harappan culture was completely indigenous to India. In the process of development the people of Sarasvati valley maintained trade relation with Baluchistan, Sind and the combined Punjab.

40. EXCAVATION AT BALU, DISTRICT KAITHAL.— In continuation of earlier work (1992-93, pp. 34-36), the Department of Ancient Indian History, Culture and Archaeology, the Kurukshetra University, Kurukshetra resumed excavation at Balu under the direction of U.V. Singh, S.P. Shukla, Arun Kesarwani, and B.K. Kathil.

A series of trenches (M1 to S1) were partially excavated to lay bare the habitation of the Harappan period. The walls of different houses were encountered in the excavated trenches. The houses were built time and again on the earlier foundations using mud-bricks (36 X 18 X 9 cm). In two houses, burnt floors were exposed. Besides, storage jars were also found. The partly preserved bottoms of jars found studded in the lanes perhaps served the purpose of soakage. In one Trench (01) a *bhatti*, oval in shape (150 X 130 cm) with smashed walls, found filled up with the Harappan potsherds and scattered with ash. In this trench on its southern side, a Harappan mud-brick platform, preserved upto a single course of brick, was exposed. In its alignment, another mud-brick platform adjacent to the northern side of the next Trench (PI) was found. On its front side, a partially burnt semicircular one brick-line construction was exposed. Its inner space was filled with ash. In Trenches Q1 to S1, a mud-brick structure as well as a part of the Harappan fortification wall was exposed. In trench S1, the latter was diagonally aligned. Further digging might expose the exact width of the massive Harappan fortification in this part of the mound.

On the western half of the mound, in continuation of Trench A1, six trenches (AX 1 to FX 1), were laid to expose the late Harappan material besides obtaining a long section of mound. The digging was done in the northern half portion of these trenches at varying depths. Two corn-bins on the floors of the houses filled with ash, were partially exposed. In FX 1 outer edge of the fortification wall was traced at a depth of 1.35 m.

The antiquities included terracotta bangles, beads, cakes and nodules; faience beads and bangles; beads of steatite and semiprecious stones and one chert blade and a few copper objects. The Harappan pottery was collected in various forms and designs. The late Harappan assemblage included thick and crudely made pottery with incised designs similar to the late Bara type. A number of samples of carbonized grains were collected from different layers for analysis by the Birbal Sahni Institute of Palaeobotany, Lucknow.

41. EXPLORATIONS IN DISTRICT ROHTAK.—Ashok Kumar, research scholar of the Department of History, M.D. University, Rohtak, in the course of village-to-village survey in Jhajjar tehsil of Badli region, discovered the following sites with cultural remains ranging from the pre-Harappan to the medieval times.

<i>Site</i>	<i>Nature of remains</i>
Badli-II	Pre-Harappan; Harappan; late Harappan
Badli-III	Historical and medieval
Badli-IV	Medieval
Badsha	Medieval
Daryapur	Medieval
Dewerkhana	Medieval
Jhangirpur	Historical; medieval
Kheri Jat	Historical
Khungai	Late Harappan; medieval
Lagarpur-I	Medieval
Lagarpur-II	Late Harappan
Mohmadpur-Majra	Early medieval; medieval
Nimana	Medieval
Sondhi-I	Medieval

42. EXCAVATION AT SUGH, DISTRICT YAMUNA NAGAR.—M. Acharya assisted by Ranvir Singh. Kali Ram, Anand Parkash Jangra, V.K. Gupta, Ved Pal Singh and Aman Kumar of the Department of Archaeology and Museums, Government of Haryana, conducted excavation at Sugh with the objective of determining the cultural sequence of the site. Sugh (30°9' N; 77° 23'E), situated about 5 km east of Jagadhri, the tehsil headquarters and presently within the jurisdiction of village Amadapur, enjoyed considerable importance during ancient times when it was known as Srughna. Earliest reference to this place as Turghna occurs in the *Taittiriya Aranyaka*. The road from Mathura to this town has been called Shraughna by Panini. Its name has also been mentioned by Varahamihira and the Buddhist texts like

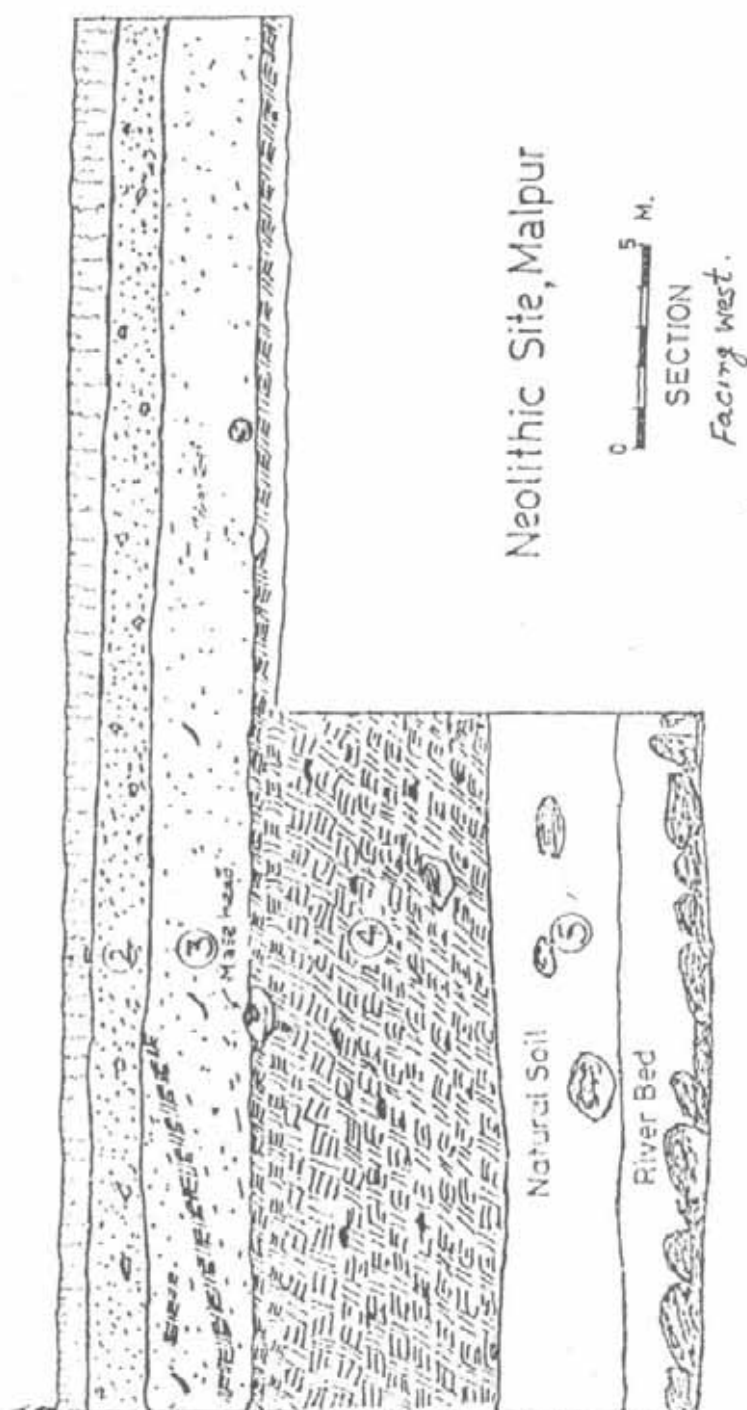


Fig. 19.

Mahamayuri and *Divyavadana*. The Chinese pilgrim Hiuen Tsang found an Asokan pillar and a monastery here in the seventh century. The site continued to remain an important place till the twelfth century probably because of its location on an important east-west trade route.

The excavation, undertaken in eight quadrants, revealed a two-fold cultural sequence. The Trench XR2 Qd IV was dug to a maximum depth of 2-90 m which yielded 2-10 m thick cultural deposit overlying the yellowish brown silt constituting the natural soil. Finds comprised pottery, terracotta objects, etc.

The cultural deposit of Period I (fifth-first century BC), constituted by greyish ash mixed with earth and a large number of potsherds lying on the natural soil, is characterized by the occurrence of plain grey, Black-slipped ware and black-polished wares which are generally associated with the NBP Ware of the Gangetic valley. Only two sherds of NBPW in steel grey and black colours were found. But the shapes of NBPW, like convex-sided dish and bowls, carinated *handi*, etc., were found in other associated wares. The other ceramics are wheel-made and of coarse fabric. No structural remains could be encountered here in this period but for the two ring-wells (dia 70 cm) consisting of a few rings placed one above the other as encountered from the lowest level. Notable antiquities of this period comprised terracotta animal figurines, hand-made female figurines, beads of semiprecious stones, glass and terracotta and few copper objects.

Period-II (first century BC-third century AD) is characterized by the early historical red ware, stamped pottery and the Sunga-Kushan terracottas. This period is also marked by the disappearance of NBP and its associated wares. Houses were of mud-bricks or burnt-bricks. One mud-brick structure of five courses and two baked brick (38x23x8 cm) structures of eleven and two courses were noticed in two different quadrants. A large number of terracotta objects including that of human and animal figurines, moulded as well as hand-made, were recovered. Female figurines with heavy ornamentation, transparent drapery and other relief figures in moulded plaques depict the characteristic Sunga art tradition. An interesting plaque (with upper portion missing) depicting a child learning alphabets on a wooden plate was also found from this level. The Kushan terracottas comprising human figurines besides mould-made and hand-made animals show exuberant style. The female figurines were, however, more popular than the male forms with exquisite ornamentation and drapery. The figurines of animals include elephant, bull, horse, etc. Terracotta disc, cart-wheel, balls and marbles constitute the other set of toys for children. The ornaments comprised beads of jasper, carnelian, agate, terracotta and glass.

JAMMU AND KASHMIR

43. EXCAVATION AT MALPUR, DISTRICT JAMMU.— The Srinagar Circle of the Survey conducted intensive exploration and a small-scale excavation at Malpur (32°52' 20"; 74°44') > 28 km north of Jammu and located on the left bank of Ranbir Canal, under the direction of R.S. Fonia, assisted by Vijay Shankar, A.K. Pandey and Balbir Singh. The main objective of the exploration and excavation was to ascertain the origin of cultures and chronology of tools as scores of Neolithic sites yielding prehistoric

tools were explored previously but none of these sites were excavated so far to determine their stratigraphy. To know the details of the settlement on the evidence of artefacts, a trial excavation was conducted at Malpur (fig. 19).

Two diagonally opposite quadrants were taken up for examination. Two sections were maintained on the southern and the western sides of the trench. At a depth of 1.70m the lowest level comprising bed of boulders and pebbles was found. The occupational deposit was found to be confined in the upper 50 cm only. In all, five layers were encountered in the digging, of which layer 1 is humus while layers 2 to 4 form the compact natural alluvial soil mixed with stone tools and flakes. Layer 3 forms a floor with patches and burnt boulders. Tiny pieces of charcoal were in layer 2 while layer 5 forms the main bed.

The excavation revealed a few neolithic artefacts in the form of celt, chisel, ring-stone, quern, pounder, ball, blades and scrapers. A few unfinished tools with refuse material were also found. Generally, the tools were of sandstone pebbles and a few polished ones were made on black basalt. Typologically, the artefacts resemble those found at Burzahom and Gufkral in the Kashmir valley. The Stone tools in surface collection comprise choppers, scrapers, querns, etc.

Only limited quantity of pottery including the sherds of hand-made red ware of medium to thick fabric which are not well-burnt were collected.

KARNATAKA

44. EXCAVATION AT HAMPI, DISTRICT BELLARY.— In continuation of the previous year's (1992-93, pp.38-41) work, the Bangalore Circle of the Survey under the direction of K.P. Poonacha, assisted by S.K. Joshi, T.P. Balakrishna Unnithan, Anand Tirtha and Meghraj, M. Hadpad, resumed excavation at Hampi in the area to the north-east of the Sarasvati temple near the rock-cut temple (pl. VIA) in order to probe further into an untapped area to the south of STR-1 (exposed during the previous season) and brought to light a passage connecting STR-1 through its southern entrance with STR-3 (also exposed during 1992-93). This passage is found plastered with lime-plaster. In the area to the north-west of STR-1, clearance of debris exposed the western wall of STR-3 and an open area behind the structure.

In addition to excavation, the structures (STR-1, 2,3, and 4), exposed during the previous two seasons, were brought to relief by removing baulks of 1m width, besides these structures were reconstructed wherever necessary as per the original plan and elevation (pl. VIB) by making use of the available fallen members. The damaged lime-plastered floor and the plastered wall surfaces were appropriately strengthened by proper filleting.

The fallen cyclopean enclosure walls of STR-1, 2 and 3 were constructed to a required height to bring the structural layout to relief. The water storage tanks and the network of channels supplying water to them were reconditioned as per the original by making use of rubble and lime mortar.

Excavation was also taken up in an area of 1,200 sq m to the north-west of the Hazara Ramachandra temple complex and in all twelve trenches of 10 m square were laid within the mint

EXPLORATIONS AND EXCAVATIONS

enclosure. As a result, a rectangular terraced palatial structure (pl. VII) facing north and measuring 2215 m (EW) X 1600 m (NS) was exposed. The structure stands to a total height of 2.30 m. Built in three levels, each distinguished by moulded basements, the structure was provided with two flights of steps at its lateral extreme ends on the east as well as the west at the second and third level. Each balustraded step once had well caprisoned elephants (second 1.05 X 1.60) and snarling lions (first).

At present, they are found in highly mutilated condition and the lion at the eastern side in the first landing and the elephant at the west in the second one are totally destroyed. The moulded basements are typical of the Vijayanagara period as well-decorated with motifs like row of swans, lotus petals, *kudus*, elephant, horsemen and episodes of *panchatantra*, all distributed over the traditional or conventional mouldings of *pada*, *adhopadma*, *kantha*, *pattika* and *urdhvakumuda* mouldings. Each of these ornate/moulded levels or terraces project into the succeeding level gallery. Extensive heat, exfoliation, growth of vegetation and wanton destruction have damaged these ornate mouldings sometimes into unretrievable fragments. The first landing (in descending order) stands to a height of 0.40 m and measures 18.25 X 5.20 m. The second measures 17.10 X 4.55 m and stands to a height of 0.90 m. Each level has a row of eight pillars, the extreme ones are built into the wall. These are placed at the free end of the terrace and are embedded into the floor of each level at equal distance of 2 to 2.30 m. The entire terraced structure is built in uncoursed rubble masonry in mud-mortar and lime-plastered both externally and internally. The walls measure 0.60 to 0.80 m in width.

The floor of the terraces, laid in broken pebble jelly mixed in lime mortar is finished with finely ground lime-plaster. The structure exhibits atleast three successive layers of 4 to 5 mm thick plastering, speaking of periodical repairs. To the north of this terraced-structure a huge courtyard of 17.05 X 20.00 m was exposed. Thus at its extreme north has a disturbed guard platform measuring 3.34 X 2.75 m wherein two square non-ornate granite pillars of 0.75 X 0.30 and 0.50 X 0.30 m are embedded. To the west of this courtyard is a gallery (0.15m) raised above the floor level of the courtyard measuring 15.10 X 4.25 m. The hind wall of the gallery projects 0-50 m into the gallery resulting in a central offset projection.

The above terraced-structure has in all three entrances: (1) at north-east measuring 6.35 X 2.55m leading from the major eastern entrance to the complex; (2) a small 0-80 wide lateral entrance at the west placed between the western gallery and the terraced-structure; and (3) an entrance at the north, to the west of the guard platform leading to the residential quarters measuring 1.45 m in width.

The antiquities encountered during the excavation comprise a gold coin, copper coins, copper rings and bells, lynch pins, spikes and caltrops of iron, miniature Siva-linga of soap-stone, beads of semiprecious stones, glass and terracotta and bangle pieces of glass.

To the south-east of this structure, a well, cut into the natural gruss, was also encountered. Slab stone veneering is provided at the top surface of this well to prevent collapsing of the edges.

Besides excavations, the structures exposed in the enclosure during the previous two seasons, were also conserved. The northern and eastern faces of the western platform (northern entrance to Rang

Mahal) and another basement to its east located to the south-west of the Hazara Ramachandra temple in the Mint enclosure were reconstructed as per the original plan and elevation (pi. VIII) by making use of the available fallen moulded members. The east-west and north-south running walls over the basements were also restored in rubbles set in mud-mortar and were watertightened by applying a layer of lime plaster at the top surface. The adjoining area with depressions ranging between 1 m to 1.5 m was levelled by filling up with rubble and earth and brought to the original working level.

45. EXPLORATION IN HOSPET AND SANDUR TALUKS, DISTRICT BELLARY.—W.V.S.Narasimhan of the Bangalore Circle of the Survey brought to light the following antiquarian remains during the course of village-to-village survey in Hospet and Sandur taluks of District Bellary.

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Hospet	Anantasayanagudi (76°24-5'N; 15°17'E)	Anantasayana temple with Kannada and Nagari inscriptions (AD 1549) and Lakshmi-Narasimha shrine of sixteenth century
-do-	Ayindahalli (76°22'N; 15°10'E)	Two-lined Kannada inscription on a boulder of seventeenth century
-do-	Bayaluvaddigeri (76°31-5'N; 15°14-5'E)	Four hero-stones (medieval period); two Kannada inscriptions of fifteenth-eighteenth century; two circular bastions of post Vijayanagara period
-do-	Belagodu (76°23-5'N; 15°18'E)	A ruined temple of seventeenth-eighteenth century
-do-	Buvanahalli (76°37'N; 15°13-5'E)	Microliths on chert; early historical pottery of red and black wares; a circular bastion of post-Vijayanagara period
-do-	Byalakundi (76°24-5'N; 15°06-5'E)	A hero-stone of medieval period; two ruined bastions of post-Vijayanagara period
-do-	Chittavadigi (76°22-5'N; 15°17-5'E)	Three temples (Vijayanagara and post-Vijayanagara periods)
-do-	Danapura (76°26'N; 15°19'E)	Neolithic celt; a few microlithic tools on chert and a faded rock painting
-do-	Dhanapuram (76°22'N; 15°10-5'E)	Fragment of a hero-stone; completely ruined fortress with bastions and a mound of iron slag with terracotta pipeline of sixteenth century

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<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Hospet	Dhanayakanakere (76°21.5'N; 15°08'E)	Paramesvara temple, loose sculptures, two hero-stones, a <i>sati-stone</i> (medieval period); a four-lined Kannada inscription (AD 1549); a tank built within a fortress with four bastions (post-Vijayanagara period)
-do-	Dharmasagaram (76°33-5'N; 15°14'E)	Circular bastion (post-Vijayanagara period)
-do-	Gadiganuru (76°36'N; 15°13-5'E)	A stray microlith, fluted core; a disturbed ash-mound; a few sherds of red and black-and-red wares; a Si va temple and two hero-stones and a ruined bastion of medieval period
-do-	Garaga (76°25'N; 15°05-5'E)	A hero-stone and loose sculptures of medieval period (post-Vijayanagara period)
-do-	Gollarahalli (76°22-5'N; 15°06-5'E)	A hero-stone, a Kamma temple and a mound with scattered iron slag of eighteenth century
-do-	Gudiobalapuram (76°23-5'N; 15°18'E)	A few sherds of black-and red-ware; faded rock paintings noticed in a locality called Kumbargudi; traces of a fort-wall, loose sculptures, boulder inscription in Nagari characters of Vijayanagara period
-do-	Gundlavaddigeri (76°31'N; 15°13-5'E)	Dilapidated Iswara temple, loose sculptures, a long tank bund with two sluices of medieval period; a Kannada stone inscription of seventeenth-eighteenth century; a ruined fort-wall with bastions (post-Vijayanagara period)
-do- Hospet	(76°23-5'N; 15°16-5'E)	Vadakaraya temple, twelfth century; Sannakki Virabhadra temple with two Kannada inscriptions (AD 1531); loose sculptures, and a Kannada inscription of AD 152 (3); palm-leaf manuscripts at Kottur <i>matha</i> ; two old step-wells; four-lined Arabic inscription in a mosque; five tombs (eighteenth century)

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Hospet	Hosuru (76°21'N; 15°17-5'E)	Temples of the Vijayanagara and post-Vijayanagara periods; loose sculptures; inscriptions and a hero-stone of Vijayanagara period; fort-wall with bastions surrounding the village
-do-	Ingali (76°26-5'N; 15°15-5'E)	A small pecked celt; a disturbed ash mound; two stone inscriptions in Kannada; two hero-stones and loose sculptures (medieval period); and iron slag pieces
-do-	Jambunathanahalli (76°24-5'N; 15°14'E)	Jambunatha temple and Kannada inscriptions on two pillars of a pavilion in the pathway (Vijayanagara period), a ruined tomb (eighteenth century); two ruined tanks with sluices of late medieval period
-do-	Kakabalu (76°31-5'N; 15°13'E)	Disturbed ash mound with tiny sherds of black-and red-wares, two hero-stones of the medieval period; a Kannada inscription of eighteenth century
-do-	Kallaghatti (76°25'N; 15°19-5'E)	Two Kannada inscriptions (sixteenth century); three hero-stones; bas-reliefs of Vijayanagara period; a ruined fortress with bastions of post-Vijayanagara period
-do-	Kallahalli (76°24-5'N; 15°13'E)	A stone inscription in Kannada, dated AD 1540; a circular bastion (late medieval period)
-do-	Kallirampura (76°23'N; 15°18'E)	Hero-stone and a stone inscription in Kannada (Vijayanagara period)
-do-	Kariganuru (76°26'N; 15°16'E)	A few microlithic chert pieces; two ruined bastions with rubble wall
-do-	Kondinayakanahalli (76°25'N; 15°17'E)	A dilapidated temple; a pavilion; loose sculptures of Vijayanagara period; two stone inscriptions of fifteenth-sixteenth century; bastion of post-Vijayanagara period
-do-	Kotiginahalu (76°35'N; 15°13'E)	A hero-stone of medieval period; a circular bastion of late Vijayanagara period

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<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Hospet	Malapannanagudi (76°26'N; 15°17'E)	Mallikarjuna temple with a Kannada inscription and two bastions of sixteenth century; Kannada inscription (AD 1412); a well called Sulai bhavi with inscription; three hero-stones; dilapidated temples of fifteenth-sixteenth century and loose sculptures of Vijayanagara period
-do-	Manyammanahalli (76°21-5'N; 15°09-5'E)	Loose sculptures and architectural members of Vijayanagara period
-do-	Muddalapuram (76°23-5'N; 15°17-5'E)	A stone inscription in Kannada dated AD 1535
-do-	Nagalapuram (76°22-5'N; 15°05-5'E)	Dilapidated temples and fragmentary sculptures of medieval and post-Vijayanagara periods; two circular bastions of post-Vijayanagara period
-do-	Narasapura (76°23-5'N; 15°19'E)	A dilapidated temple, three hero-stones and Kannada inscription on a boulder (Vijayanagara period)
-do-	Nagenahalli (76°24'N; 15°18'E)	Ranganatha temple with a stone inscription in Kannada dated AD 1516 and two bastions at its two corners, and a long ruined tank-bund (Vijayanagara period)
-do-	Papinayakanahalli (76°29'N; 15°14-5'E)	Medieval temples; four Kannada inscriptions of sixteenth-eighteenth century, hero-stones, two circular bastions (post-Vijayanagara period)
-do-	Rajapuram (76°24'N; 15°13-5'E)	Breached tank-bund with two sluices (medieval period); a ruined bastion (late medieval period)
-do-	Sankalpuram (76°25'N; 15°16'E)	A stone inscription in Kannada dated AD 1513; ruined bastion
-do-	Singanathanahalli (76°26-5'N; 15°19"E)	A dilapidated temple and pavilions of sixteenth-seventeenth century; a Kannada inscription on a boulder dated AD 1509; loose sculptures and a bas-relief of Vijayanagara period

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Sandur	Appayanahalli (Narayanapur) (76°37'N; 14°59-5'E)	A Kannada stone inscription (seventeenth-eighteenth century); partly ruined circular bastion (late medieval period)
-do-	Bhavihalli (Sushilanagar) (76°29-5'N; 15°07-5'E)	Four mutilated Tirthankara sculptures, one having four line Kannada inscription (medieval period)
-do-	Ettinahatti (Taranagar) (76°36-5'N; 15°07-5'E)	Hero-stone (medieval period)
-do-	Gandibasapura (Shankarapur) (76°36'N; 15°07'E)	Loose sculptures (medieval period) in a small shrine; a fortress with bastion (late medieval period)
-do-	Hunisevute (Siddapur) (76°28'N; 15°H'E)	Two ruined circular bations (late medieval period)
-do-	Hosahalli (Bhujanganagar) (76°35'N; 15°05'E)	Hero-stone (medieval period); two lable inscriptions in Nagari characters on boundary stones and a partly ruined circular bastion (late medieval period)
-do-	Kammadheruvu (Deogiri) (76°37'N; 15°01'E)	A small ruined rectangular structure (medieval period); ruined circular bastion (late medieval period)
-do-	Konapura (Dowlatur) (76°32'N; 15°6-5'E)	Bas-relief of a bird on two boundary stones (seventeenth-eighteenth century)
-do-	Krishnanagar (76°36-5'N; 15°O6'E)	Fortress of Tipu period (eighteenth century)
-do-	Medarahalli (Jaisingapur) (76°26-5'N; 15°11'E)	Microlithic fluted core and chert pieces; fragmentary hero-stone (medieval period); ruined circular bastion (late medieval period)
-do-	Mudukulpenta (Ranjitpur) (76°36-5'N; 15°02-5'E)	Four line stone inscription (Kannada) of eighteenth century; a bas-relief of Hanuman (late medieval period)

<i>Taluk</i>	<i>Village</i>	<i>Nature of remains</i>
Sandur	Narasapur (Narasingapur) (76°36-5'N; 15°04'E)	Bas-relief of Hanuman in two pieces (late medieval period)
-do-	Ramagad (Ramandurg) (76°27-5'N; 15°07-5'E)	Fort-wall; a stone inscription in Kannada (AD 1528); loose sculptures; sculptural fragments; broken pedestals, etc., (medieval period); structures and graveyard of British period

46. EXPLORATION IN DISTRICT CHIKMAGALUR.— C.S. Seshadri of Bangalore Circle of the Survey during the course of his exploration of the submergence area under the Upper Bhadra project in Mudigere taluk of District Chikmagalur brought to light the following antiquarian remains.

<i>Village</i>	<i>Nature of remains</i>
<i>Left Bank</i>	
Bale Hole (13°16'20"N; 75°24'15"E)	Kesava temple of sixteenth century
Halsur (13°19'22"N; 75°27'30"E)	Swords of eighteenth century (kept in a temple for worship)
Horanadu (13°14'30"N; 75°22'12"E)	Parsvanatha <i>basadi</i> of fifteenth-sixteenth century; inscribed <i>nishidi</i> stones of fifteenth century: inscription dated AD 1675 of Venkatadri Nayaka recording grants to Annapurneshvari temple
Kabbinamane (13° 16'30"N; 75°29' 15"E)	Siva temple of post-Vijayanagara period; loose sculptures of Nandi and Ganesa
Kagganahalla (13°17'15"N; 75°24'45"E)	Lower Palaeolithic tools from the pebble bed on the banks of Bhadra river
Magundi (13°16'30"N; 75°29'15"E)	Loose sculptures of <i>Sapta-matrikas</i> , Mahishamardini and Ganesa of sixteenth century and inscribed hero-stones
Tanudi (13° 17' 15"N; 75°25'45"E)	Durga temple of seventeenth century; inscribed hero-stones; wooden structure of eighteenth century, weapons and dress materials of post-Vijayanagara period

47. EXCAVATION AT BADAGA KAJEKARU, DISTRICT DAKSHINA KANNADA.— The Prehistory Branch, Nagpur, of the Survey, under the direction of L.S.Rao, assisted by N.Taher, K.M. Girhe, R.K. Dwivedi, C.L. Yadav, Ghayasuddin and R.G. Katole, excavated two urn-burials of Megalithic period, which

were exposed in a roadside cutting while laying a new road at Badaga Kajekaru (12°55'N; 72° 11'E) in taluk Bantval, to ascertain the nature of cultural remains.

The upper portion of the Urn-burial 1 is missing but the exposed portion shows that it is an ill-fired coarse red ware of medium fabric accompanied with two miniature bowls of thin red ware fabric (pl. IX B). Besides, an iron chisel was collected from the urn and a few bits of charcoal were also noticed.

The Urn-burial 2 is a burnished black-and-red ware pot of thick fabric made of medium coarse clay. It contained six miniature red ware bowls, four of which are mutilated. Of the remaining two, one is rimless and the other has a beaded rim. Besides, the urn contained a few fragile bone fragments. Some thick coarse red ware sherds have also been collected as associated material.

48. EXCAVATION AT KOTATATTU, DISTRICT DAKSHINA KANNADA.—The Prehistory Branch, Nagpur of the Survey, under the direction of L.S.Rao, assisted by N. Taher, K.M. Girhe, R.K. Dwivedi, C.L. Yadav, Ghayasuddin and R.G. Katole, undertook a trial excavation at Kotatattu (13°31 'N; 74°42'E) in Udupi taluk, as a few Neolithic celts were found from this site while digging a foundation.

The surrounding area betrayed the presence of large quantities of potsherds strewn around. Here, a trench measuring 1 X 2 m with the larger axis in the east-west orientation was laid. In all, five layers were observed at a total depth of 2.60 m. Layer (1) measuring 0 to 0.5 m represents humus. Layer (2) measuring 0.5 to 0.25 m is a habitation deposit of compact yellowish silt. This layer yielded red ware and grey ware of the historical period (?). In association with pottery, ash and small quantity of charcoal were noticed. Layer (3) measuring 0.25 to 0.85 m is a water-borne loose sandy silt, sterile deposit. Layer (4) measuring 0.85 to 1.10 m also represents a sterile but compact brown silt deposit. Layer (5) measuring 1.10 to 2.50 m represents natural laterite composition.

It is in layer (5) near the section facing the west, a huge pit was noticed. And from the nature of this irregular pit it appears that the pit remained open over a long period of time. The nature of the deposit shows that the pit was indiscretely filled with assorted fragments of pottery. In its association a considerable quantity of ash and bits of charcoal was also noticed. The pottery recovered from the pit could broadly be classified into two categories viz., red ware and grey ware. Within the red ware there are two varieties, one is a thick sturdy red ware, whereas the other type includes an ill-fired thin red ware with a thick coat of chocolate-coloured slip having a crackled surface. The types include jar and vases. The grey ware is similar in its composition to that of the thin red ware. However, it does not show crackled surface. All the above-said category of pottery are wheel-made and the decoration on the pottery includes incised line designs.

In addition to the pottery, a few faceted terracotta cake/tile-like objects were also recovered from the pit.

49. EXPLORATION IN DISTRICT DAKSHINA KANNADA.— In continuation of the last year's work (1992-93, pp.47-48), L.S. Rao, assisted by N.Taher, K.M. Girhe, R.K. Dwivedi, C.L. Yadav, Ghayasuddin and R.G. Katole of the Prehistory Branch, Nagpur, of the Survey, conducted investigations to ascertain prehistoric potentiality of the west coast of Karnataka. The area covered lies between Bhatkal in the north and Mangalore in the south.

EXPLORATIONS AND EXCAVATIONS

The exploration revealed Mesolithic, Neolithic, Megalithic and Historical remains from various sites. Besides, a solitary unifacial chopper was also collected from the river bed near Naravi. It is observed that the Mesolithic remains are spread on top of the laterite hills and granitic outcrops lying at varying contour levels between 3 to 130 m MSL. The types of artefacts include points, scrapers, borers, blades, flakes, fluted cores, etc.

Tools from majority of the sites are fabricated on milky quartz. The sites at Kukkundur, Baindur and Muda.Konaja, however, yielded a few blades and fluted cores of dark cherty material. Of the Mesolithic sites, the richest artefacts were noticed at Kukkundur (pl.IX A) and Baindur.

A solitary Neolithic implement collected from Kotatattu is in the form of a saddle fragment. The Neolithic artefacts have already been reported from here.

At Badaga-Kajekaru, which is known for Megalithic chamber tombs; a considerable number of urn-burials which are badly exposed due to laying of new road have been noticed. Two of such damaged urns found in the roadside cutting, were systematically exposed.

Besides, a few sites yielded sherds of red ware and black ware of the Historical period and two inscriptions of the Vijayanagara period.

The following are the sites belonging to different cultural periods.

<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Bantval	Badaga Kajekaru (12°55'N;75°1rE)	Microlithic artefacts on milky quartz including side-scrapers besides a large quantity of quartz raw material; Megalithic urn-burials; highly mutilated series of urns containing miniature bowls and bits of charcoal; coarse red ware pottery, ill-fired, of medium thick to thin fabric
-do-	Machchina (12°56'N;75°14'E)	Microliths; raw material being quartz, the assemblage include scrapers, a broken blade along with a large quantity of waste material
Beltangady	Naravi	Solitary unifacial chopper
Coondapoor	Baindur (13°53'N;74°37'E)	Microlithic artefacts mostly made on river-borne quartz, pebbles, including flakes, scrapers, points, blades, cores and waste material
-do-	Gantihole (13°50'N;74°39'E)	Microlithic artefacts made on fine-grained quartz including scrapers, points, blades and cores

<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Karkal	Andar Chouki (13°19'N;74°03'E)	Microliths on milky quartz
-do-	Jarkala (13°16'N;75°03'E)	Microliths made on quartz including a few points, scrapers, flakes and cores
-do-	Karkal (13°13'N;74°59'E)	Microliths, a few artefacts like points, scrapers, etc., made on quartz
^do-	Kukkundur (13°16'N;74°57'E)	Microliths and bigger artefacts; both made on chert and quartz; including points, scrapers, fluted cores, etc
-do-	Mudakonaje (13°04'N;75°04'E)	Microliths in association with Megaliths; artefacts made both on chert and quartz
-do-	Sanuru (13°1rN;74°59'E)	Microliths made on quartz
Udipi	Billadi (13°31'N;74°48'E)	Two Vijayanagara inscriptions of medieval period with depiction of Si\' <i>d-linga; nandi</i> , lamp, dagger, sun and crescent on the top
-do-	Haradi (13°26'N;74°43'E)	Microlithic artefacts made on quartz including scrapers, fragments of blades, a crescent and cores; red ware and black ware sherds of Historical period
-do-	Kotatattu (13°3rN;74°42'E)	Broken fragment of a saddle of Neolithic period

50. EXPLORATION IN HANGAL TALUK, DISTRICT DHARWAD.— T.M. Keshava of the Bangalore Circle of the Survey, during the course of village-to-village survey brought to light the following antiquarian remains.

<i>Village</i>	<i>Nature of remains</i>
Akkivalli (14°46'42"N;75°10'44"E)	Two temples:Kalmesvara (twelfth century) and Hanuman temple (fifteenth century); loose sculptures of <i>Sapta-matrika; nandi</i> , Karttikeya, Vishnu, a few flag-stones and <i>mahasati-stones</i> (twelfth century)
Araleshwar (14°47'08"N;75°10'40"E)	Brick-built Kadambalingesvara temple (AD 1099); loose sculptures of Sarasvati, Bhairava, <i>nandi</i> . Ganesa and a mutilated Jaina Tirthankara (twelfth century)

<i>Village</i>	<i>Nature of remains</i>
Arekop (14°46'N;75°05'12"E)	Microliths on milky quartz, fluted cores, waste flakes, burins, points and blades
Chikkanagi (14°47'N;75°04'32"E)	Kadambesvara temple of twelfth century
Hangal (14°46'N;75°07'30"E)	Microliths of blade-burin, flake variety on milky quartz; black-and-red ware, burnished red ware, russett coated white painted pottery of early historic affinity around a circular swamp called "Bheemanagardi"; loose sculptures of buffalo-head, <i>naga</i> and hero-stones of twelfth century; a fragmentary inscription of eighth century
Hirekanagi (14°45'34"N;75°04'20"E)	Later Chalukya temple of Sankara (AD 1072) Mutilated
Kuntan Hoshalli (14°46'32"N;75°08'52"E)	sculpture of Dakshinamurti (twelfth century)
Malligar (14°47'48"N;75°08'26"E)	Kallesvara temple with sculptures of <i>Sapta-matrika</i> and Bhairavi and Siddesvara temple with loose sculptures like hero-and sari-stones (twelfth century)
Nisima Alad Katti (14°48'48"N;75°10'06"E)	Kalyani Chalukya temple known as Nisimesvara (twelfth century)
Savasgi (14°47'36"N;75°09'48"E)	Kallesvara temple; loose sculptures of <i>Sapta-matrika</i> , Bhairavi, Vishnu, Virabhadra and Uma-Mahesvara, datable to twelfth century

51. EXCAVATION AT HASARGUNDIGI, SANNATI, DISTRICT GULBARGA.— The Bangalore Circle of the Survey carried out intensive exploration spreading over an area of 120 sq km around Sannati where the Government of Karnataka proposed the construction of an irrigational barrage across river Bhima, a tributary of the river Krishna. In the course of excavation at Sannati, the Directorate of Archaeology and Museums, Karnataka under D.V. Devaraj, assisted by H.T. Talwar, brought to notice a clay pendant, Rouletted Ware, a stone-disc, beads of lapis-lazuli, jasper, carnelian, ivory, silver, punch-marked and lead coins, besides terracotta beads and figurines. The overwhelming vestiges of prehistoric, protohistoric, early historical and medieval cultural assemblages, found in some of the sites, prompted the Bangalore Circle of the Survey to undertake trial excavations at Hasargundigi, Sannati (Ranamandala) and Kanaganhalli, under the direction of K.P.Poonacha, assisted by P. Venkatesan,

M.V. Vishweswara, W.V.S.Narasimhan, Anand Tirtha, T.P.Balakrishna Unnithan, M.V.Mallikarjuna and S.L.B. Desai.

The trenches were laid in an area of 625 sq m encompassing the entire mound of about 2 m height, which yielded a complete plan (pl. XI) of a highly disturbed circular brick-stupa and *ayaka* platforms, originally enclosed by a limestone railing with upright and crossbars of which a few damaged members were found scattered around the main brick-structure.

The extant base portion of the stupa is circular on plan and 13 -70 m in diameter. It is built of burnt bricks (51 X 27 X 7.5 cm) and their uniformity throughout shows that the structure belongs to a single constructional phase. The foundation is of rectangular limestone nodules, arranged on edge over the black cotton soil and rammed to form a solid base, over which rises the brick courses of the drum of the stupa. Brick courses arranged alternately are bound by fine levigated clay in the core portion, while the outer layer is pointed with lime mortar, probably as a protective measure. The extant maximum height of the drum portion measures 90 cm comprising eleven courses and the exterior surface exhibits traces of lime plaster at places. Much of the structure is destroyed due to agricultural activity, thus making it difficult to determine the elevational details. The stupa has rectangular *ayaka* platforms (1 X 1 6 X 1m) abutting the drum at cardinal directions. Small limestone slabs found on the *ayaka* platforms were probably used as base/cushion to the pillars. That the *ayaka* pillars carried a coping member is evident from a roughly rectangular limestone member found near the western entrance. A circumambulatory passage of 2.85 m with traces of lime plaster was also found around the stupa. That the brick-and-lime stupa was enclosed by a limestone railing is evident from a number of architectural members such as uprights (pl. XA) with mortices and cross bars lying at regular intervals all around the stupa. Both uprights and cross bars are decorated exteriorly with pronounced lotus medallions, the largest one measuring 32.5 cm in diameter. That the stupa was not bereft of artistic expressions commonly noticed in similar edifices of the contemporary period is evident from a few ornamental panels probably used to decorate the exterior of the edifice. These rectangular panels having decorated border depict animals such as elephants (pl. XB), bull, boar, tiger, horses and galloping antelope exhibiting their natural form.

Interestingly, for laying lime plastered passage, red ware sherds were used. Some of the red polished ware sherds appear pale due to waterlogging. Section scrapping of a small trial pit further west of the stupa site yielded a large number of tiles. Antiquities retrieved from the excavations include lead/ potin coins, some having Ujjain symbol on the obverse, obviously indicating their association with the Satavahana issues already reported from the Sannati area. Other antiquities retrieved from the excavation include fragments of terracotta figurines in worn-out condition and fragments of shell bangles.

52. EXCAVATION AT TALKAD, DISTRICT MYSORE.—D.V.Devaraj of the Directorate of Archaeology and Museums, Government of Karnataka, in collaboration with the Post-graduate Department of Ancient History and Archaeology, University of Mysore, unearthed the base of a long brick wall on the southwestern brink of the old historic city of Talkad. The wall 6 ft thick at the base probably rose to a

height of about 20ft. It runs for several hundred feet of which about 120 ft was exposed. This was identified as a wind breaker, datable to about the seventeenth century, built in order to protect the township of Talkad from submergence under the sand-dunes.

In the upper two layers of the Trench TK-V, there were recovered four copper coins of the Vijayanagara king Vira Narasimha (AD 1506-1509) indicating that layers 1 and 2 are definitely of the Vijayanagara and post-Vijayanagara days while the sand deposition at Talkad is a phenomenon of the late sixteenth century. An important feature noticed here is the availability of metal objects in good number. Copper rods, long bar of plano-convex surface, iron lock, sickle, rods, besides irregular pieces of iron and copper were collected at a depth of 2 m (layer-6).

The eastern side of the fort/enclosure/bund wall has given some definite clues regarding the water supply system for the township of Talkad; the water being drawn from the river Kaveri. Another fascinating discovery of this system is that the water supply channels were connected to a nearby bathing pond. This pond (3.65 X 3.65 m) is of burnt bricks with fine lime plaster on all the sides. The debris inside the pond contained a stucco image of a seated dwarf holding a pot (now missing) in his hands. To the back of this is connected a pipe for the water to flow through the mouth of the pot. The structural complex could be assignable to the Vijayanagara period.

53. EXCAVATION AT GUDNAPUR, DISTRICT UTTARA KANNADA.— In continuation of the earlier (1990-91, pp.31-32) work, the Bangalore Circle of the Survey under the direction of K.P. Poonacha, assisted by T.M. Keshava, C.S. Seshadri and Meghraj, M. Hadpad, carried out excavation first to remove all the baulks between the previously excavated trenches in order to bring the entire structural manifestation in the respective plan and elevation and also to expose the buried structures towards the north and north-east, east, south-east and south. The first phase of work successfully laid bare what appears to be servant's quarters and palace (pl. XII A) to the south-east and south of the Virabhadra temple, a temple (pl. XII B) to the north of the palace in the east-west orientation built in a *prakara*, which encloses a courtyard with a verandah and two rooms in the east (to the north-east and east of the Virabhadra temple); an elevated and moulded laterite platform to the north of the Virabhadra temple for royal personalities; a large paved hall for dancing with centrally located rectangular platform and laterite-cum-brick built large spacious structure with a flight of steps and pillared porch in the northeast facing south (another hall of dance) and a series of halls and rooms in the south, appear to be harem and servant's quarters.

The excavation revealed in the south of the Virabhadra temple a large laterite hall (14.10 X 5.20 X 1.15 m) with a series of brick pillars (collapsed), built at regular intervals (harem and servant's quarters). The southern wall of this hall also collapsed along with a southernmost *prakara*-wall which was also exposed during the work. To the east of this structure, another much disturbed hall with a flight of steps in the north and with the conventional mouldings built in laterite which is badly-disturbed was also exposed. The excavation in the north of the Virabhadra temple and to the west of eastern *prakara*-wall of the dance hall revealed a much disturbed four-coursed 2.60 m length of wall in the north-south orientation. The work to the east of the Virabhadra temple revealed a double-

enclosure *prakara*-wall, largely disturbed in the north after a distance of 20 m and runs in the north-south orientation. This 1.40 m wide wall is available to a height of 1.60 m and is built in brick and laterite. Due to vandalism, the gateway is now lost and the inner *prakara*-wall runs in the north-south orientation, and is built to the west of the first wall at a distance of 2 m. This wall having a width of 0.65 m stands to a height of 2.5 m, runs southward to a distance of 26.55 m and has totally twelve courses of brick and laterite. The foundation for this wall is of laterite blocks which after an offset of 30 cm rises vertically to form the wall proper which once again has laterite construction in the first three courses. Towards the inner side of this wall (west) and to the south-east of the Virabhadra temple, two rooms (4.80x3.80x0.40 m) which were probably used for the guards were exposed (?).

The ceramic evidence mainly show the use of red, pale grey and black wares. Interestingly, in addition to the usual wares of utility in the form of storage jars, carinated vessels, spheroidal pots, spouted vessels and sprinklers occur in a large quantity testifying to the festival of *madanotsava* mentioned in the inscriptions.

The antiquities include small statues of Ganesa, *Siva-linga*; toe rings of bone, bangle pieces and long cylindrical beads of terracotta. The noteworthy find is a spiral ear-ornament of gold retrieved in the palace area.

The excavation at Gudnapur revealed a large structural complex comprising both religious and secular structures with independent enclosures as referred to in the inscriptions of the Kadamba Ravivarma and throw a welcome light on the structural activity of a high engineering standard under the Kadamba rule of Banavasi during the fifth century.

54. EXPLORATION IN DISTRICT UTTARA KANNADA.— In continuation of the last year's work (1992-93, pp.47-48), L.S. Rao, assisted by N. Taher, K.M. Girhe, R.K. Dwivedi, C.L. Yadav, Ghayasuddin and R.G. Katole of the Prehistory Branch, Nagpur, of the Survey, discovered a Mesolithic site at Hadahir (13°58'N; 75°33'E). The site is located on top of a flat hillock to the south of Bhatkal. The artefacts are made on milky quartz and the tool kit consists of scrapers, points, fluted cores and waste material.

55. EXPLORATION IN DISTRICT UTTARA KANNADA.— K.G. Bhat Soori of the Directorate of Archaeology and Museums, Government of Karnataka, discovered the following cultural remains in Kumta taluk in District Uttara Kannada.

<i>Village</i>	<i>Nature of remains</i>
Aghanashini	Sadasiva temple (post-Vijayanagara period)
Bargi	Three hero-stones locally called <i>Ghatabeera</i> and <i>Golibeera</i> (fifteenth-sixteenth century)
Bavikodlu	<i>Siva-linga</i> with Brahmasutra (eleventh-twelfth century)
Bellangi	Ganapati (fifteenth century)
Hanahalli	Two hero-stones in Hedse Beeru temple (fifteenth-sixteenth century)

<i>Village</i>	<i>Nature of remains</i>
Hebbail	Vishnu (twelfth century)
Hegde	Hero-stone in the Hirebiru Devasthana (eighteenth century)
Hoskeri	Hero-stone (sixteenth century)
Kadme	Hero-stone in Bira Devasthana (eighteenth century)
Manaki	Mahishamardini in Durgambika temple (seventeenth century)
Masurkurve	Hero-stone in Babri Devasthana (eighteenth century)
Nagur	Ganapati in the Ganapati temple (fifteenth century) and Siva temple (eleventh century)
Torke	Three hero-stones locally called <i>Sanna Hosaba</i> , <i>Uddanda</i> and <i>Hirehosaba</i> (eighteenth century)
Uppinangadi	<i>Siva-linga</i> (eleventh century)
Vannalli	Two hero-stones (sixteenth century)

MADHYA PRADESH

56. EXPLORATION IN DISTRICT DHAR.— The Prehistory Branch, Nagpur, of the Survey, under the direction of S.B. Ota, assisted by N.G. Nikose, K.M. Saxena, N.K. Nimje and P.S. Pashine, carried out exploration in tehsils Kukshi and Manawar to ascertain the archaeological potentiality of the area before it gets submerged in the Sardar Sarovar Dam Project on Narmada. The survey brought to light the following archaeological evidences.

<i>Tehsil</i>	<i>Village</i>	<i>Nature of remains</i>
Kukshi	Bhavriya	Historical mound; temple and sculptural remains (twelfth-thirteenth century); late medieval fort remains; hero-stones
-do-	Chandankhen	Upper Palaeolithic artefacts; historical mound; stray sculptures of Siva-Parvati (twelfth thirteenth century)
-do-	Chikhalda	Chalcolithic and historical mound; temple remains and rock-cut <i>ghat</i> (medieval period)
-do-	. Daher	Historical mound; medieval temple remains

<i>Tehsil</i>	<i>Village</i>	<i>Nature of remains</i>
Kukshi	Dharamrai	Temple and sculptural remains (twelfth-thirteenth century); medieval fort and temple remains
-do-	Gehalgaon	Historical mound
-do-	Karondiya	Upper Palaeolithic artefacts; medieval mound locally known as "Rohana", remains of <i>ghat</i> (late medieval)
-do-	Katnera	Historical mound; medieval temple remains
-do-	Khaparkhera	Chalcolithic and historical mound
-do-	Kikarwas	Medieval mound
-do-	Kolgaon	Middle Palaeolithic artefacts; historical mound; temple remains (early medieval)
-do-	Koteshwar	Medieval mound; temple and sculptural remains (twelfth-thirteenth century)
-do-	Nawadpura	Microlithic artefacts; solitary piece of unidentified sculpture
-do-	Raswa	Middle Palaeolithic site
-do-	Rekti	Middle Palaeolithic site; Upper Palaeolithic site; historical mound
-do-	Warud	Chalcolithic and historical mound
Manawar	Achhoda	Medieval mound
-do-	Amlatha	Historical mound
-do-	Babulgaon	Late medieval mound
-do—	Bara Barda	Stray sculptures (eleventh-twelfth century); medieval mound and temple
-do-	Bodhwara	Temple ruins along with sculptures (eleventh-twelfth century)
-do-	Dagarpura	Middle Palaeolithic site; Upper Palaeolithic artefacts; Chalcolithic mound
-do-	Gangli	Medieval temple and sculptural remains; <i>chhatra</i> (late medieval period) and temple of Holkar's period

<i>Tehsil</i>	<i>Village</i>	<i>Nature of remains</i>
Manawar	Johur	Historical mound
-do-	Jotpur	Upper Palaeolithic artefacts; medieval mound locally known as "Narayanpura"
-do-	Junakhera	Historical mound
-do-	Khera	Historical mound
-do-	Kothra	Medieval temple remains
-do-	Malwara	Historical mound; temple remains; sculptural remains (twelfth-thirteenth century)
-do-	Perkhar	Medieval temple
-do-	Ratwa	Medieval mound
-do-	Semalda	Upper Palaeolithic artefacts; medieval mound and temples; <i>chhatris</i> (late medieval period) stray sculptures (medieval)
-do-	Sisgaon	Medieval mound and temple remains

57. EXCAVATION AT SANCHI, DISTRICT RAISEN.— The Bhopal Circle of the Survey under the direction of R.C. Agrawal, assisted by Narayan Vyas, Rekha Radha Ballabhi, R.K. Shrivastava, Khobragade conducted a small-scale excavation at Sanchi, under UNESCO Project. The purpose of excavation was to expose the buried structures.

The south-east side of Stupa 1 at Sanchi near temple 40 was taken up for excavation. The excavation revealed remains of a stupa and monasteries or the residential structure; and a stone passage running from the south-east to north-west direction. A patch of burnt earth was traced out in the innerside of a stone structure.

The antiquities found include a silver coin of the Kshatrappa ruler of western India, one pre-Mughal copper coin, iron objects such as nails, arrow-heads (pl.XIII A), terracotta animal figurines, lamp and beads, stone balls, etc.

The ceramic industry included Red Polished Ware, red ware, black ware and other types of Historical and medieval pottery. Among the shapes sprinklers, storage jar, bowls, dishes, *handis*, fragments of spouted vessels were found in large quantities.

58. EXCAVATION AT SATDHARA, DISTRICT RAISEN.— The Bhopal Circle of the Survey under the direction of R.C. Agrawal, assisted by Narayan Vyas, Manoj Dubey, Khobragade, R.K. Shrivastava, conducted a small-scale excavation at Satdhara under UNESCO Project with a view to exposing the brick stupa complex of the Mauryan period.

The Stupa Mound 31 situated on the east side of Stupa 1 was taken up first for excavation and six trenches were laid in the north-south direction. Immediately after removing the surface humus, a

floor made of *kankar* and small pieces of bricks were exposed. At the south-west and north-west sides of the mound, a single course of apsidal structure (pl. XIII B) was encountered. Further excavation on the northern slope of the Stupa Mound 32 revealed fallen brick-bats. Besides, a few ill-fired and weathered red ware sherds, pieces of NBP and iron nails were recovered.

59. EXPLORATION IN DISTRICT WEST NIMAR.— The Prehistory Branch, Nagpur, of the Survey, under the direction of S.B. Ota, assisted by N.G. Nikose, K.M. Saxena, N.K. Nimje and P.S. Pashine, undertook the exploration in Barwani and Thikri tehsils with a view to ascertaining the archaeological potentiality before the area gets submerged due to the Sardar Sarovar Dam Project on the river Narmada. The survey brought to light the following archaeological sites.

<i>Tehsil</i>	<i>Village</i>	<i>Nature of remains</i>
Barwani	Bagud	Historical mound
-do-	Bhamta	Upper Palaeolithic artefacts; historical mound; ruins of a medieval fort known as Rajgarh
-do-	Bhilkhera	Historical mound; stray fragments of sculptures; late medieval <i>chhatris</i>
-do-	Dehdala	Chalcolithic mound
^do-	Ekalra	Chalcolithic mound; historical mound locally known as "Sangaon"
-do-	Jangarwa	Medieval mound
^i o-	Kasrawad	Chalcolithic and historical mound; Siva temple of Holkar's period
-do-	Kathora	Chalcolithic mound
-do-	Khajpur	Solitary sculptural piece of a female deity
-do-	Kheri	Historical mound
-do-	Nandgaon	Medieval mound
-do-	Paliya	Stray Middle Palaeolithic artefacts; two mounds locally known as "Nayanpur" and "Sirsani" of medieval and historical periods respectively
-do-	Pendra	Medieval mound
-do-	Pichhauri	Chalcolithic and historical mound; temple remains; hero-stones
-do-	Piplaj	Historical mound

<i>Tehsil</i>	<i>Village</i>	<i>Nature of remains</i>
Barvvani	Piplod	Historical mound; remains of a temple and sculptures belonging to the twelfth-thirteenth century
-do-	Pipri	Chalcolithic mound
-do-	Segawan	Upper Palaeolithic artefacts; medieval mound
-do-	Utawad Aunli	Chalcolithic mound
Thikri	Chhota Barda	Medieval mound
-do-	Kirmohi	Upper Palaeolithic artefacts; Chalcolithic, historical and medieval mound; medieval temple remains
-do-	Lohara	Chalcolithic and historical mound
do-	Mandvvara	Chalcolithic and historical mound; temple of medieval period
-do-		Historical mound locally known as " <i>garhi</i> ": sculptures of both Brahmanical and Jaina sects belonging to the twelfth-thirteenth century.

MAHARASHTRA

60. EXCAVATION AT PAUNI, DISTRICT BHANDARA.—The Excavation Branch I, Nagpur. of the Survey, under the direction of Amarendra Nath assisted by N.C. Prakash, S. Prathapchandran, Ch. Babjirao, N.K.S. Sharma, H.J. Barapatre, D.K. Kasbi, D.S. Shambharkar, R.G. Nagulwar. A.E. Keshwar, S.M. Khaikar and Shahid Akhtar carried out further excavation at Pauni (1968-69, pp. 14-16; 1969-70, pp. 20-21). Earlier, the objectives were limited to the exposition of stupa mounds (20°48'N; 79°39'E); however, the understanding of their relationship with the contemporary habitation was left to future archaeological investigation, hence this excavation. The present work was undertaken to ascertain the nature and various phases of construction of the rampart raised around the habitation. In the previous records, the rampart is generally assigned to the medieval times. However, the discovery of the Vakataka copper plates within the rampart in 1968 compelled the scholars to date it to that era, if not earlier.

The U-shaped rampart encloses the habitation from three sides while on the northern side the perennial Wainganga serves as a natural barrier. In process of construction and time-to-time renovation, it had achieved a maximum height of about 23 m at the top of the medieval battlement towards south-west corner. However, on an average, the height of the rampart is about 10 m. Traces of a moat outside the rampart are noticed on all the three sides.

In order to achieve the above noted objectives, this season's work was confined to two areas, namely. PNI-1 (Habitation) and PNI-2 (Rampart). As a matter of fact, the area within the rampart is thickly populated. This situation caused inconvenience in laying trenches in potential areas, albeit a

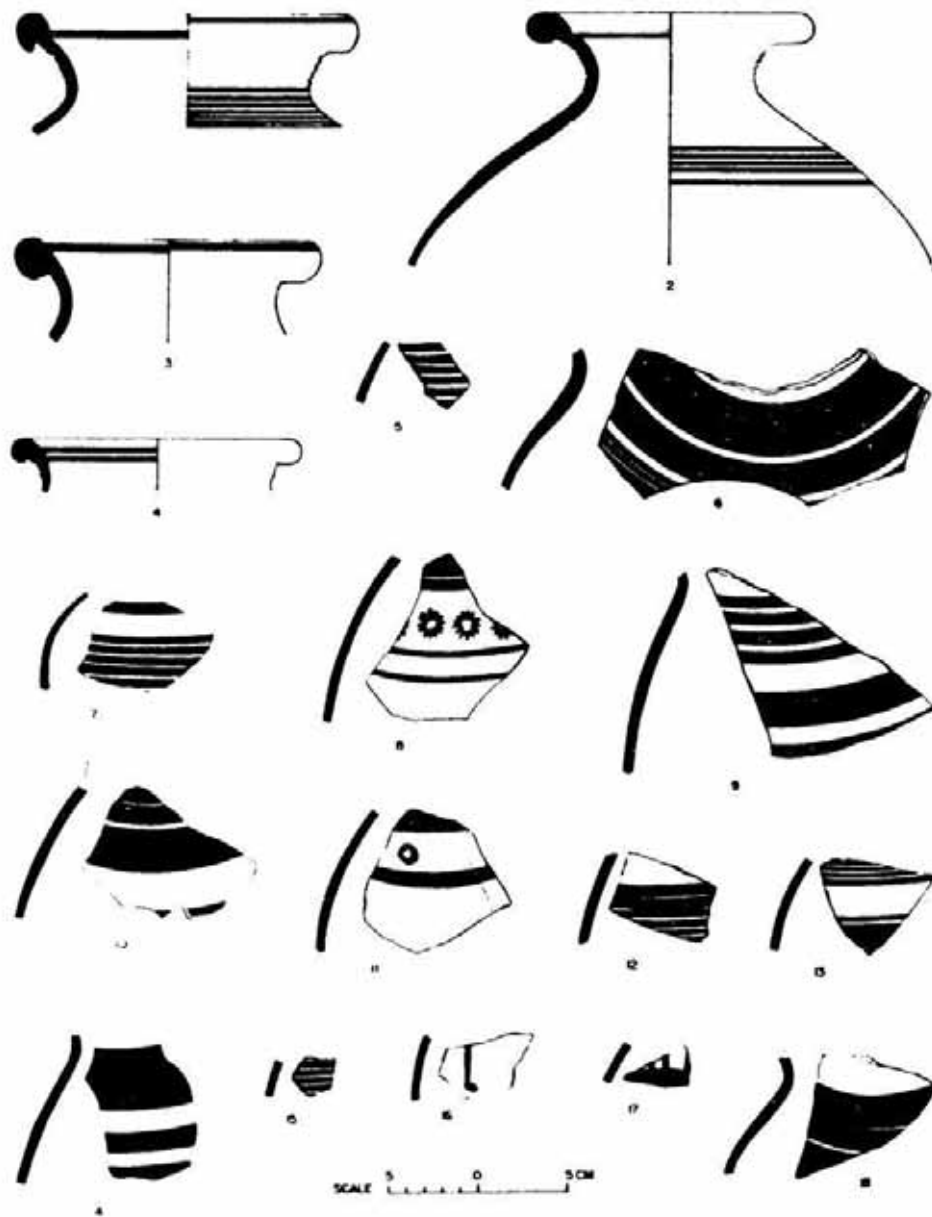


FIG. 20. Pauni: painted pottery, Period I

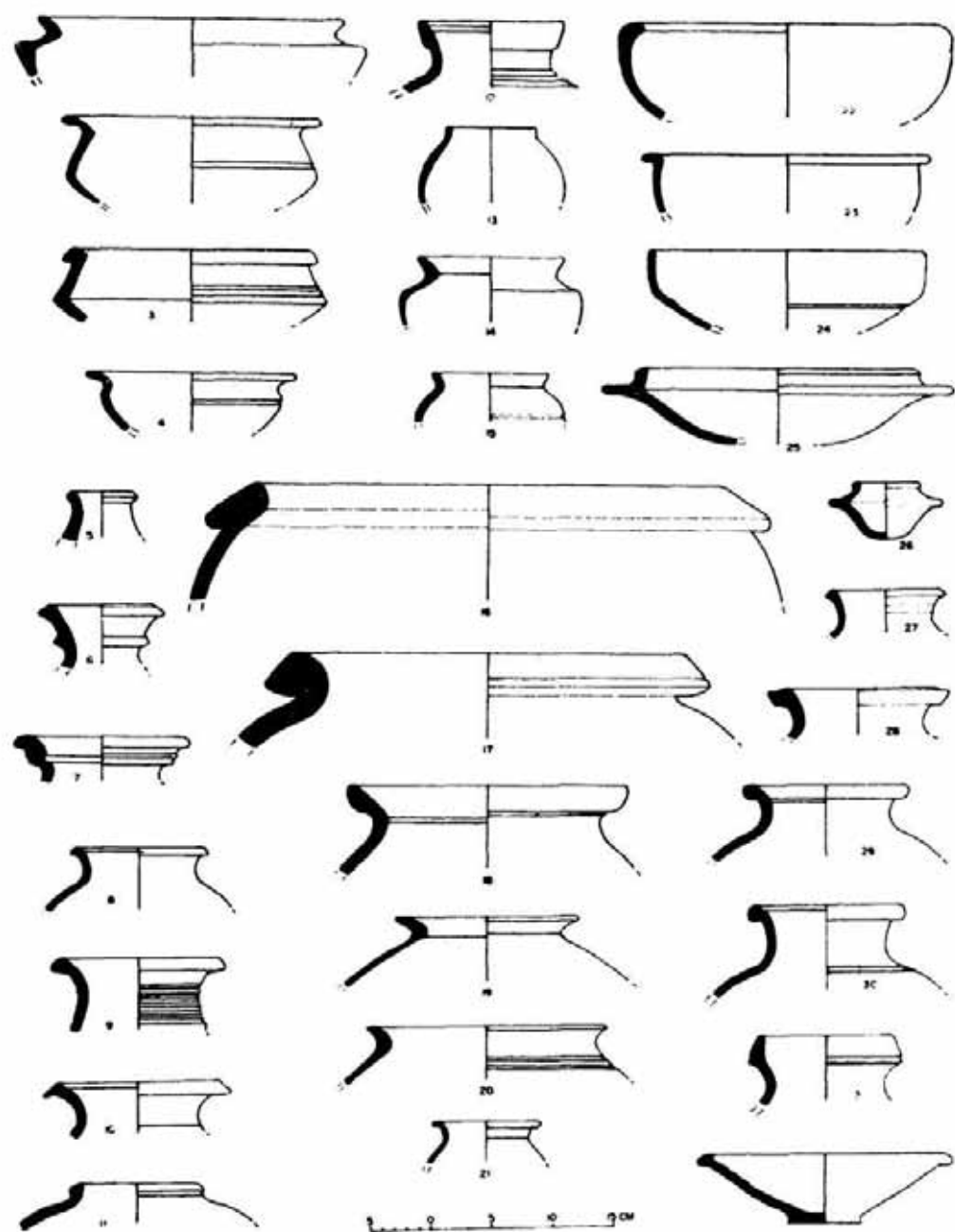


FIG. 21. *Pauni: red ware pottery*

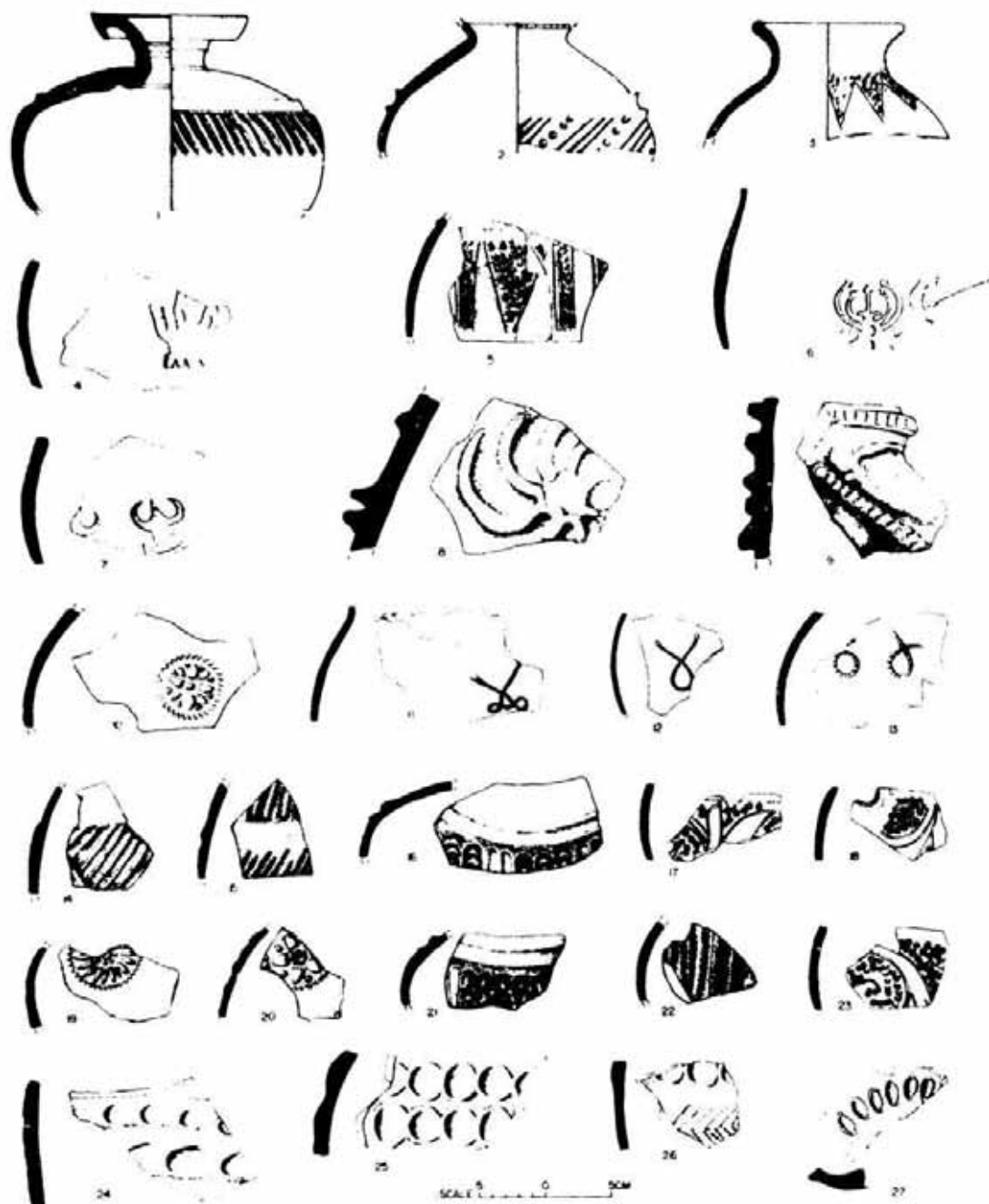


FIG. 22. Painted decorated pottery

fairly open and flat area in the southeastern sector of the habitation (PNI-1) was subjected to excavation. Cuttings taken at PNI-1 was in an area of 35 X 20 m where a total deposit of 1.75 m was noticed. In all, the deposit constituted six layers. No distinct deposit of the pre-Mauryan period was noticed at PNI-1 although the cutting across the southern rampart (PNI-2) in an area of 60 X 5 m produced a thin layer of the pre-Mauryan period (pl. XIV A).

Period I (pre-Mauryan), immediately above the natural soil, a deposit consisting of brownish grey soil layer (7), was noticed. No structural remains other than a low *murram* rampart built over the natural soil could be noticed. Potsherds found were of red and black-and-red varieties. Some of these bore paintings in red ochre (fig.20). Antiquities comprised finely finished jasper and agate beads, terracotta beads and arrow-head.

Layers (6) and (5) of both PNI-1 and PNI-2 were assigned to Period II (Mauryan). The deposit was of medium to dark brown earth. The pottery included a few NBP sherds besides the red-and-black and red wares. Floors of rammed earth and *murrain* with post-holes were also noticed in this period. Stone chips and pieces were also used for flooring as evident in one case. The second phase of the rampart was constructed during this period. Beads of stone, ivory and terracotta, besides bone comb, points and copper bangles were recovered (pl. XIV B).

Layer (4) belonging to Period III (Sunga) bearing similarity with the earlier deposit yielded a few terracotta figurines of typical Sunga style. These are made of single moulds showing plaques with flat back, displaying typical Sunga attire and ornamentation. Other antiquities included stone, glass and terracotta beads, copper antimony rods, bone stylus, terracotta wheels and skin rubbers, an etched carnelian bead and a well-carved ivory hair pin.

Layers (3) to (1) of PNI-1 and layers (3) and (2) of PNI-2 belonged to Period IV (Satavahana). The blackish brown deposit at both sites yielded red ware (fig.21) with typical decorative elements (fig.22). Structures were made of stone and bricks, most of which were disturbed due to recent agricultural activities and hence a complete house complex could not be ascertained. Circular stone platforms similar to the one noticed at Adam (1988-89, pp. 50-62) were also found here (pl.XV A). Among other important antiquities, mention may be made of etched carnelian beads, a well-made glass amulet with symbols over it, an inscribed seal, coins, beads of different material, terracotta figurines (pl. XV B), toys, wheels, spindle whorls, ear-studs, bone and ivory points, needles, stylus, copper antimony rods, bells, bangles, iron knives, points, arrow-heads, nails, stone kitchen aids, etc.

During the period, the height of the rampart was further raised by constructing a parapet-wall of burnt bricks.

The deposit of layer (1) at PNI-2 which belongs to Period V (Vakataka) was of loose dark brown colour. During this period, the rampart was further raised by adding a stone wall. The findings were mostly mixed up due to the ongoing agricultural activities. A brick well of the re-used burnt bricks and the cyclopean wall of the re-used structural elements above the Satavahana rampart helped in appropriating the deposit to the Vakatakas.

61. EXPLORATION IN DISTRICT CHANDRAPUR.— The Prehistory Branch, Nagpur, of the Survey under the direction of S.B. Ota, assisted by N.K. Nimje, P.S. Pashine, R.K. Dwivedi and P.C. Dogra, carried out geo-archaeological investigations of the Acheulian site at Papamiya-Tekdi (79° 18' 54"E; 19°57'13"N) with a view to ascertaining the stratigraphical position of various successive Stone Age cultural remains as described by L.K. Srinivasan (1960-61, pp.22-25).

The site at Papamiya-Tekdi lies about 5 km north-east of the District headquarters Chandrapur on Ambe *nullah* (locally known as Jharpat *nullah*), a tributary of Wardha river. The main concentration of artefacts at the site was noticed on the right bank of the *nullah*. Apart from surface investigation, a trial trench measuring 20X10 m was taken up in one of the exposed quarry sections.

The stratigraphy observed at the site shows that yellowish sandy compact clay rests over the bed-rock. The thickness of this sediment varies differentially depending on the undulating surface feature of the bed-rock. This yellowish sandy compact clay horizon is devoid of both artefacts and rubbles. Overlying the yellowish sandy compact clay horizon, there is the rubble deposit which is implimentiferous with Acheulian artefacts. The matrix of this rubble horizon is composed of sandy gravelly sediment of yellowish colour and is compact. The thickness of this sediment varies depending on the undulating surface of the underlying sediment. The implimentiferous rubble horizon is overlain by the older alluvium which is yellowish clay with *kankar* nodules and also devoid of artefacts. It is preserved in pockets at the site. Overlying the older alluvium is the reddish brown sandy sediment, the top of which contains microliths.

The geo-morphological observations made during the investigations suggest that the site got occupied during Acheulian cultural period when the Ambe *nullah* was depositing the rubbles as its over bank deposit. This high energy sedimentation must have taken place when the rainfall was quite good in the area. Subsequently, the older alluvium got deposited over the Acheulian horizon. This older alluvium is dated back to the terminal Pleistocene arid climatic regime. Overlying the older alluvium is the reddish brown sandy sediment as a low energy sedimentation process. When the deposition process of this sediments got seized, the site was occupied once again during microlithic times. Probably climate during this period became congenial with better rainfall than before.

Further, observations made during the investigation suggest that there is cultural hiatus between Acheulian and microlithic cultural phase. This contradicts the earlier view (1960-61; pp. 22-24) that there is a continuous succession of lithic industry from Series I to microliths through Series II, the observation was based on the surface collection only. Moreover, the assemblage which was considered earlier as Series II industry is nothing but the smaller artefact component and forms part of the Acheulian assemblage.

The Acheulian industry comprises both heavy and light duty tools and includes choppers both unifacial and bifacial, handaxes (pl. XVI A), cleavers (pl. XVI B), picks, scrapers, etc.. besides simple artefacts. The Acheulian artefacts are mostly fabricated on locally available shale, and a few on coarse-grained sandstone and fine-grained quartzite. Coarse-grained sandstone forms the bed-rock, the exposure of which can be seen at certain places in the locality: whereas the fine-grained quartzite as raw

material is certainly not locally available. The most noteworthy evidence associated with Acheulian horizon include a solitary pounder (pl. XVIC) of coarse-grained sandstone and pieces of silicified wood (pl. XVI D) of which one bears slight working. The preliminary morpho-metrical observations of the artefacts suggest that the assemblage belongs to the late Acheulian cultural phase. The toponomical observations made on artefacts and the statistical analysis of the assemblage including micro-debitage clearly indicate that this site is semi-primary in nature. It is mainly a habitational site where tools were also manufactured.

The microlithic artefacts occur in clusters in the top horizon of reddish brown sandy sediment, unlike the Acheulian horizon which spreads over a larger area at the site. The microlithic assemblage mostly comprises lunates, triangles, backed-blades, simple blades, both blade and flake cores, etc. and are fabricated mainly on chalcedony, chert and carnelian.

62. EXPLORATION IN DISTRICT ELLORA.—The Prehistory Branch, Nagpur, of the Survey under the direction of S.B. Ota, assisted by R.K. Dwivedi, N.K. Nimje and P.V. Janardhanan. and R.S. Thakur of the Aurangabad Circle of the Survey, undertook exploration of the surrounding area of the famous rock-cut cave at Ellora and brought to light an Upper Palaeolithic site.

The Upper Palaeolithic site (75° 10'39"E; 20°0'41 "N) at Ellora lies about 1.75 km south of the main rock-cut cave complex and about 0-5 km away from the left side of Khuldabad-Ellora road. As the site is located at the pediment surface of the hill range, it gently slopes towards the west. A small stream locally known as Telban *nullah* flows almost touching the southern periphery of the site.

A large number of artefacts in the form of surface scatter was noticed here covering an area of about 5,000 sq in. The stratigraphical context of these artefacts is the older alluvium of terminal Pleistocene Period, which is characterized by compact yellowish sandy silt with *kankar* nodules. The site is badly disturbed and the artefacts are exposed to the surface due to recent cultivation, soil erosion and earth quarrying activities. The artefacts seem to occur throughout this deposit. Besides the concentration of artefacts at the site, it has been noticed that artefacts in lesser quantity do occur almost throughout the valley close to the pediment surface.

On the basis of the typo-technological features of the artefacts it is clear that the assemblage belongs to the Upper Palaeolithic cultural phase (pl. XVII). The assemblage comprises backed blades, lunates, points, scrapers and simple artefacts such as blades, blade cores, flake, flake cores, etc. The blade artefacts are mostly fabricated on chalcedony and a few are on jasper, whereas the bigger artefacts are on the latter. Both chalcedony and jasper nodules are found in abundance locally in the form of veins and pockets in Deccan Trap. Besides, hammer stones were also collected from this site.

The noteworthy feature of this site is the association of artefacts with faunal remains (pi. XVIII A) and ostrich egg-shell pieces (pl. XVIII B). The faunal assemblage comprises *Cervus* sp., *Axis axis*, *Bos* sp., *Equus* sp., and *Antelope cervicapra*. The fluorine-phosphate ratio analysed on the bones of *Axis axis* confirms that it belongs to terminal Pleistocene Period.

63. EXCAVATION AT SHIRKANDA, DISTRICT NAGPUR.—The Department of Ancient Indian History, Culture and Archaeology, University of Nagpur, under the joint direction of Chandrashekhar Gupta and

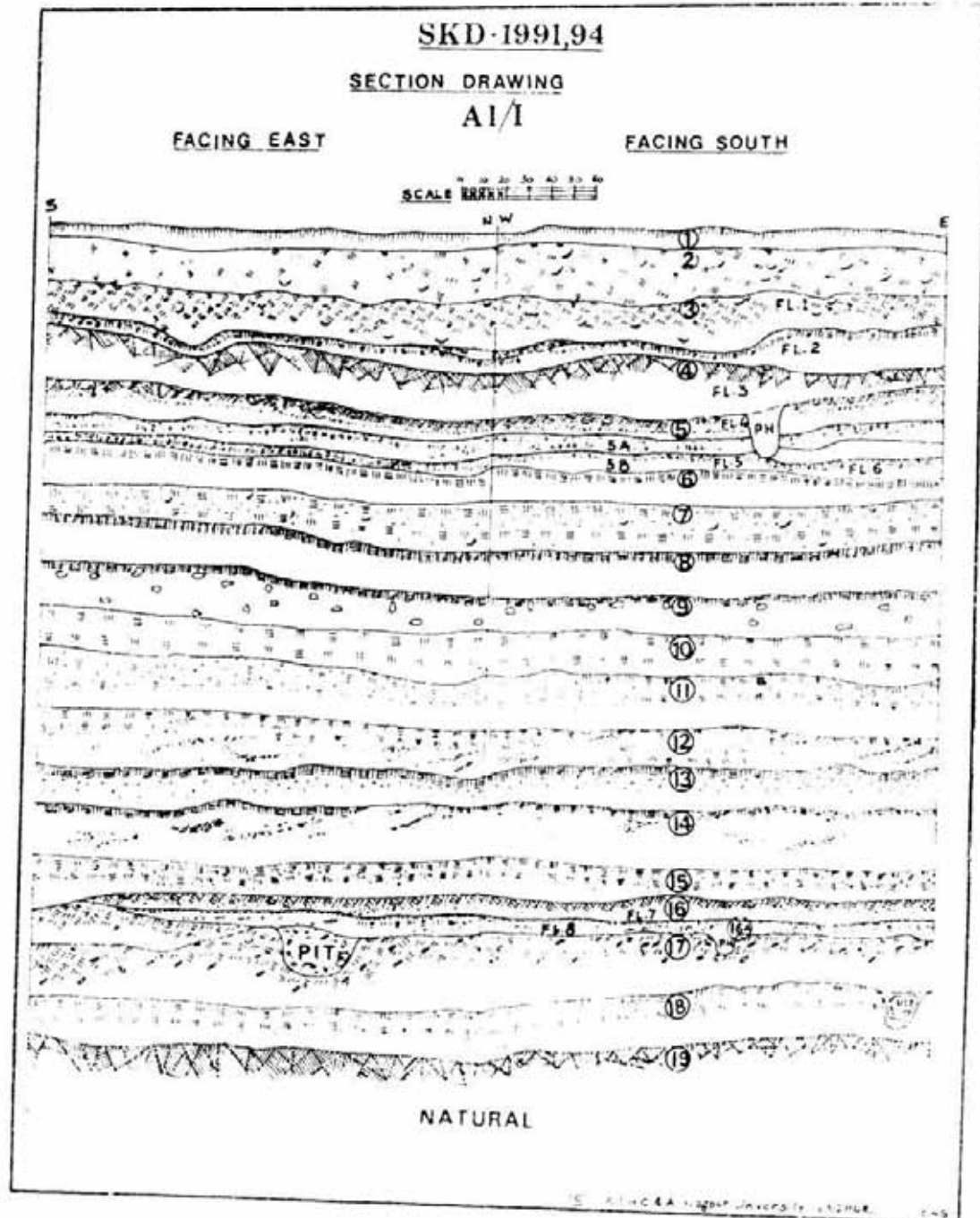


Fig. 23.

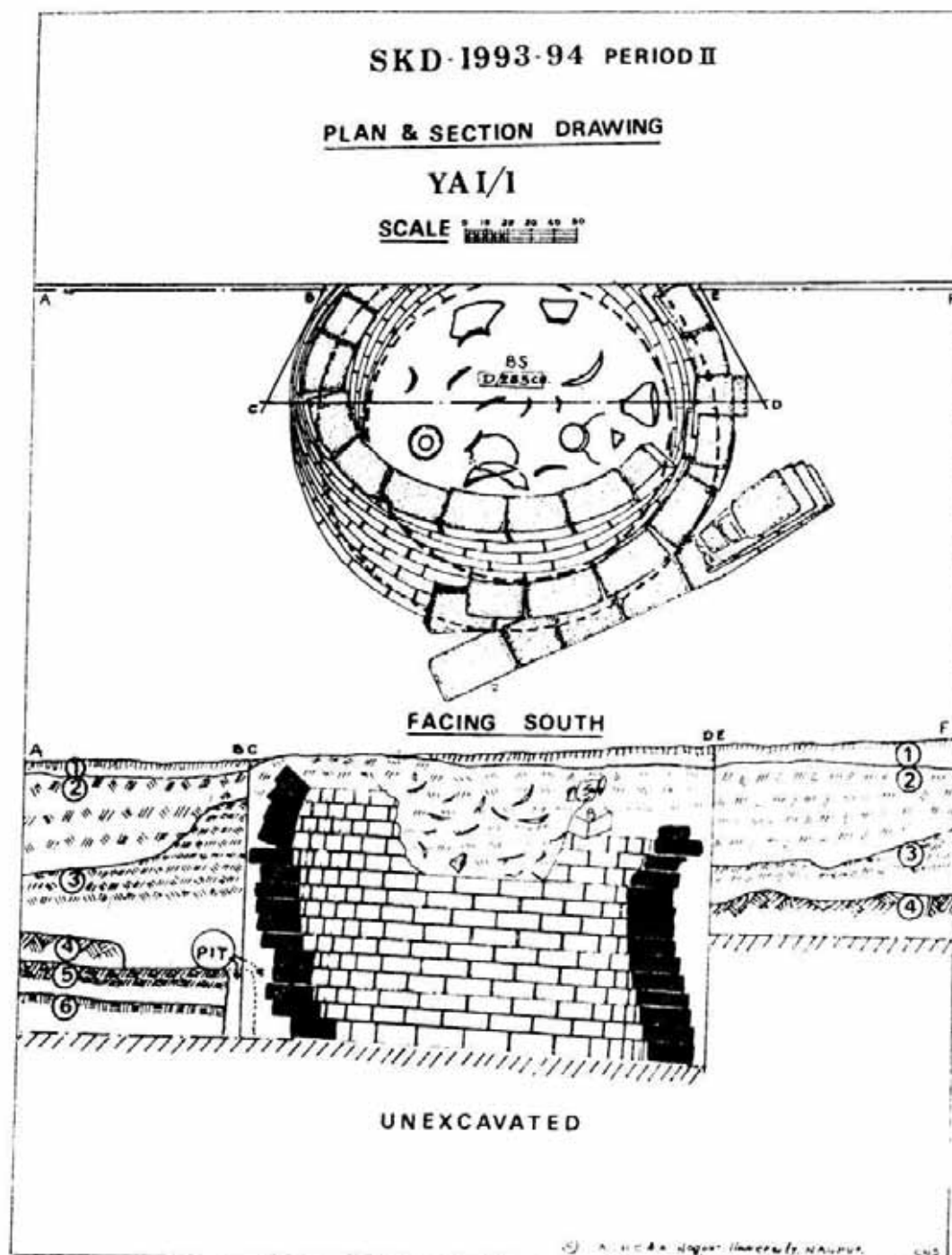


FIG. 24.

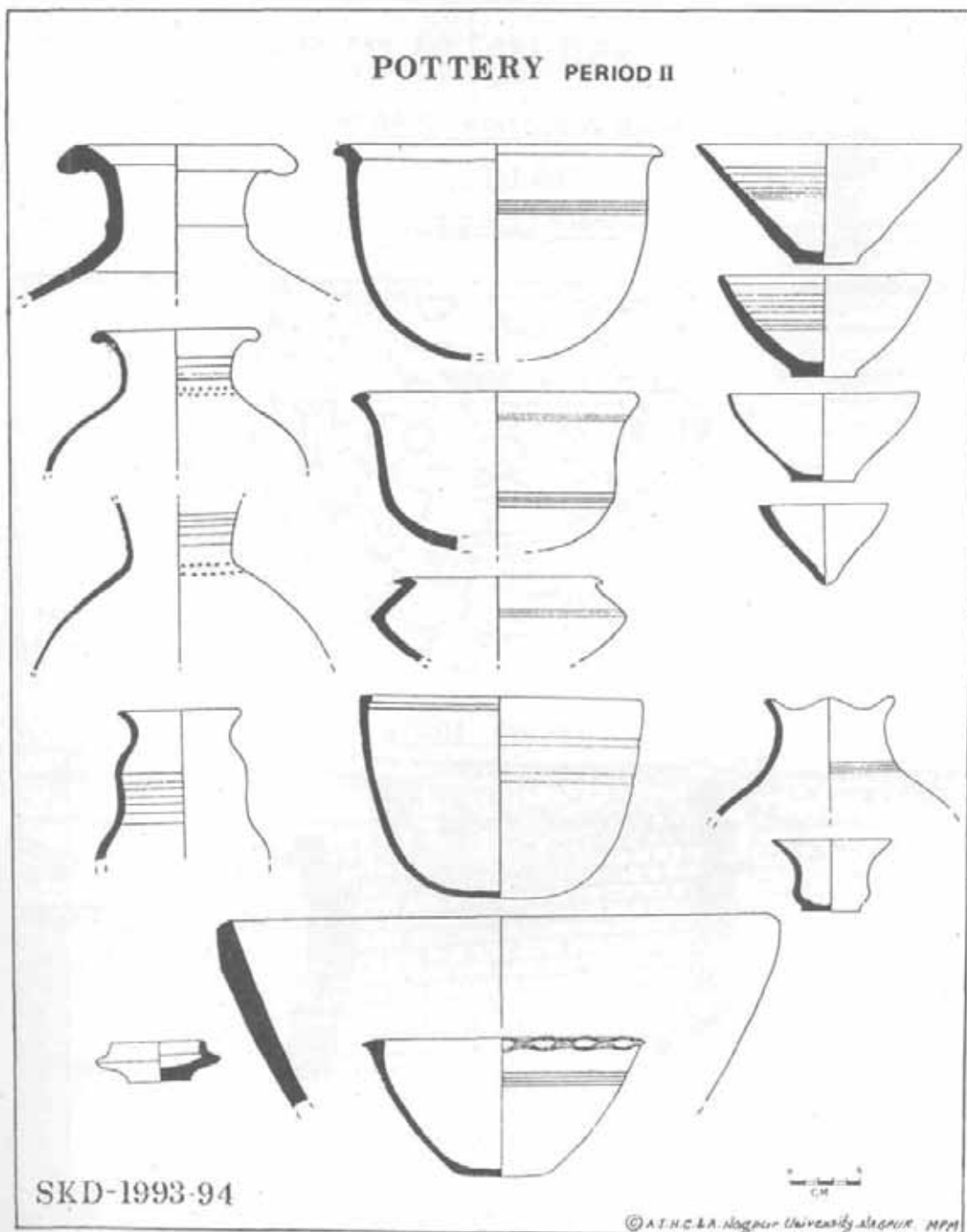


FIG. 25. Shirkanda: pottery

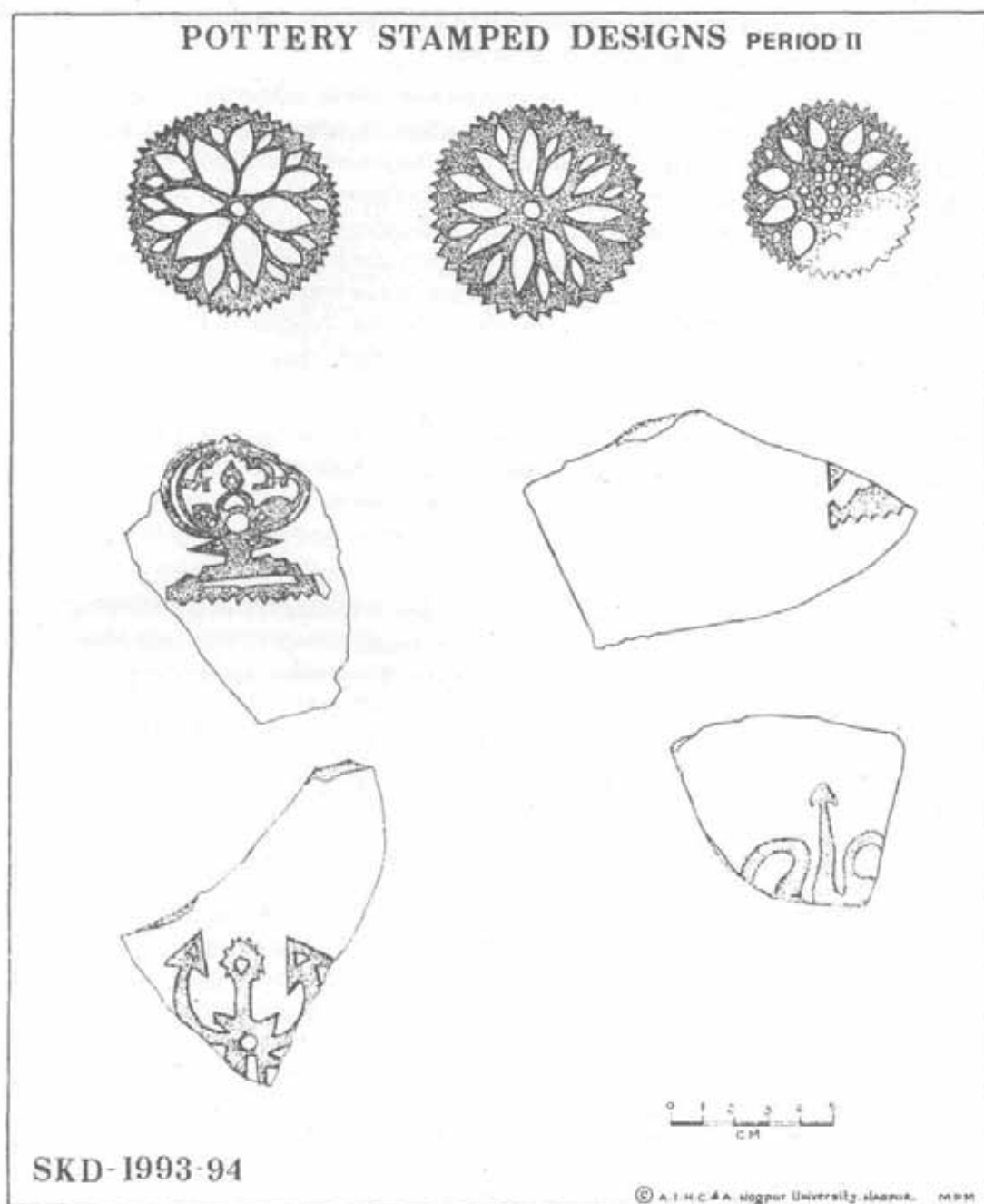


FIG. 26. *Shirkanda: stamped designs*

Ismail Kellellu assisted by P.S. Meshram, C.N. Saharkar, Damodar Aglave and the post-graduate students of the University resumed excavations at Shirkanda (21°17'N; 79 3TE) in tehsil Mauda. Besides confirming the cultural vestiges reported earlier {1991-92, pp. 68-69}. the site revealed a deep and finely built brick well of the early historical period.

Further excavation in Qd I of Trench A1 revealed a 3-90 m habitational deposit divided into nineteen occupational layers belonging to the Iron age (fig. 23). Although the black painted red ware was present throughout, its occurrence in the middle layers was more prolific than in the lower and upper levels. Other wares included black, black-slipped, red, red-slipped, micaceous red and black-and-red wares. Important types were bowls and dishes in black-and-red ware; vases of different sizes and types in red and micaceous wares; urns and storage jars mostly in micaceous red ware. As was noticed earlier the painted designs include straight or oblique lines on both the internal and external surfaces of the rim of the bowls, dishes, vases and urns. Besides, the designs on the shoulder or inside the bottom of the bowls, dishes and vases include hatched-diamonds, comb or bird's feet-like designs, basket weaving patterns, etc.

Antiquities which are very few include iron slag and nail-like objects; marbles and beads of different sizes in terracotta; glass bangles and hopscotches of both stone and potsherds. The surface finds include a globular cornelian bead and a copper bangle. Also encountered was a kiln/hearth similar to the (circular) one found during the first season. Burnt floors and pits were also noticed. The animal bones include cattle, sheep/goat and rodents.

Of all the structures encountered during this season, a circular brick well belonging to early historical period is noteworthy (fig. 24). The well with a diameter of 1.40 m was made of wedge-shaped baked bricks of different sizes while the bricks used for the portion above the ground measured 25 X 16 X 7 cm; those used for below the surface measured 38 X 24 X 7.8 cm. The others used for constructing the platform attached to the southeastern side of the well above the surface, probably for drawing water, measured 32 X 18 X 6 cm. Sticky mud seems to have been used as binding material in the construction of the well. Although the present water level in the adjacent river is 7 m below, the level might have been just a few meters when the well was dug long after the protohistoric people had abandoned the site.

On the basis of the filling material which includes hundreds of vases, bowls, *lotas* and jars, exclusively in red ware of both slipped and unslipped variety (fig.25), a double-moulded terracotta figurine and comparable stamped designs on the pottery (fig. 26), it seems that the well was systematically used for dumping pottery during the second and the fourth centuries AD after which the well had dried up.

Different types and sizes of pottery strongly suggest their exclusive use as liquid containers, and after some ritual was performed near the well, the used pottery was deliberately thrown into the well. About 2-80 m deep inside the well was dug which revealed nearly thirty-five courses.

ORISSA

64. EXCAVATION AT BARABATI FORT, DISTRICT CUTTACK.— In continuation of last year's work (1992-93, pp. 78-81), the Excavation Branch-IV, Bhubaneswar, of the Survey, under the direction of

EXPLORATIONS AND EXCAVATIONS

K. Veerabhadra Rao, assisted by N.K. Sinha, P.N. Biswas, M.P. Singh, Bhagaban Behera, R.N. Sahoo, S.K. Bhoi. resumed excavations at Barabati Fort with the objectives of establishing the structural sequence and mode of construction of the palace apart from exposing the structures as far as possible in the limited area.

The excavations were mainly conducted on the north-east corner of the mound and the evidence gathered from the excavation along with those of the earlier excavation. The structural activity could be divided into four periods.

In Period I, a creamy white khondalite stone pavement with brick rubble soling was found at a depth of 6-9 m in ZA3 and ZB4 (pl. XIX). To this period also belongs the stone wall of laterite blocks lying above the pavement. This pavement measures 23.2 m long and 1 -90 m wide and runs in the east-west orientation and probably served as a pathway between the structures in Period I, as the area should be becoming slushy during the rainy season not only due to high precipitation but also to the rising waters of the river Mahanandi during monsoon. The working level of the stone pavement was connected to the pillared platform which was found during the year 1992-93 and referred to as a temple. It was found that the working level of the pillared platform and that of the pavement is one and the same. Similar pillared platform was also found outside the palace area on the southern side during the year 1992-93. But only the pillared platform which was found below the foundation of the palace was referred to as temple, though both are on the same level. Levels taken at the pillared platform, found below the heavy foundation columns and those outside the palace indicate that there is a difference of 23 cm. Taking into consideration the distance between these two pillared platforms, which is more than 75 m, the difference, however, is negligible. These platforms have a core of dressed laterite blocks and a veneering of creamy white khondalite stone, carved into mouldings. These in no way resemble the characteristic *pabhaga* mouldings of the Orissan temple architecture. It is very common to have mouldings at the plinth of the secular buildings during the medieval period.

These platforms have pillar bases also of white khondalite stone above them: at places pieces are joined together by iron dowels. Further when compared with architectural fragments found in the filling, the stone of the pillar bases appears very soft to bear the load of a magnificent temple. Most of the architectural fragments found during the course of excavations are made of deep reddish brown khondalite stone with spots of iron. Further if at all there was a temple, it should belong to a period between the construction of Lingaraja temple at Bhubaneswar and the Sun temple at Konarak. as the Nagari plates of Ananga Bhima Deva III (AD 1211-38) refers to a temple of *Purushottarna* at Abhinava Varanasi Kataka. But the pillared platform does not betray the finesse of the Orissan architecture and sculpture of the contemporary period. Further, the slots provided for the pillar hardly measure 2 feet sq. Ab-ul-Fazl, who visited Cuttack himself narrated that the remains of *a* magnificent temple were on the southern side of the palace of Raja Mukunda Deva. Under the circumstances these pillared platforms are very common during the medieval period for keeping the king's personal army. No portion of the temple was encountered *in situ* in excavation and all the architectural fragments and sculptures were found only in the filling between the heavy foundation columns and the retaining-wall on the four sides.

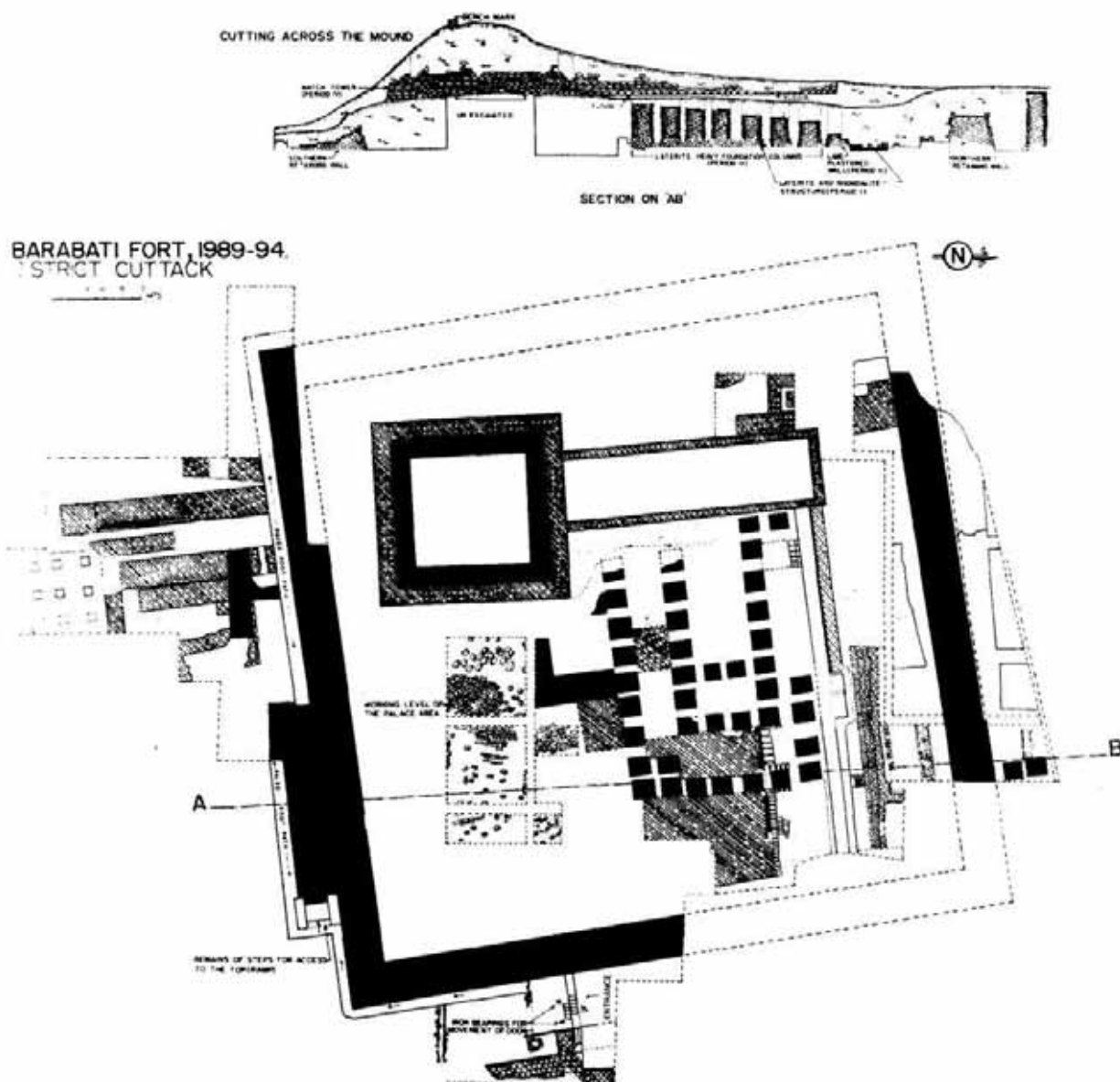


Fig. 27.

To Period II belongs the plastered wall running in the east-west orientation over the structures of Period-I (pl. XX). Its eastern portion lies under P.W.D. quarters whereas the western portion runs under the ramp of the watchtower of Period IV. The available portion of the wall measures 40 m in length and is 2.2 m in width. It is built of dressed laterite stone and both its faces are plastered with thin lime mortar. It has a strong foundation of eight courses with footings. There is also a step-like projecting platform, 51.8 m long and 1.7 m wide, at the working level of the plastered wall. It has a hole running across the length of the plastered wall and the step-like projection on its northern side running in the north-south orientation to drain off rain water from the area, which was once enclosed by this plastered wall. The drain hole corresponds to the working level of this plastered wall of Period II. The working level of Periods I and II are separated by structural debris of a thickness of 1.70 m.

From the foregoing account, it appears that the plastered wall had an entrance facing north at the point where the step is located. It is difficult to state the nature of structures which were enclosed by this wall. But, on the basis of the structural remains, it is possible that this must have enclosed the structures similar to those of Period I. The structures of Period II were dismantled and the material was used for structures of Period III. But the plastered wall was not completely destroyed as it was probably incorporated in the scheme of structures of Period III.

Period III mainly represents the construction of the palace of Raja Mukunda Deva (AD 1560-68). The construction of the palace itself is an architectural innovation of the medieval period (fig. 27). Here the relation of local geography to the architecture is well established. The area is found to be flooded during the rainy season and this fact has been observed by the availability of sandy layers below the structures. Abul-Fazal who visited Cuttack around 1595 stated that for 5 or 6 *kos* around the fort the country used to be flooded during the rains. To protect the palace against floods and have a commanding view of the area all around, the builder of this palace adopted a unique technique by constructing heavy foundation columns (pl. XXI) on the remains of structures of Period II without digging any foundation trench: the space between the pillars was filled-up to the required level. This appears to be the main reason for pillars being out-of-plumb, and not being in regular alignment. After laying three or four courses, the space in-between was filled-up to facilitate further raising of the columns without using any scaffolding. The actual palace started only above these foundation columns. No floor was found between the foundation columns and none of the columns was plastered. The working level of the palace is still visible over the surface of the mound and a coin of Shah Jahan was found on this working level during earlier excavations. These foundation columns have on average of 2.2 m square and the highest one measures 6.70 m comprising thirty-one courses of dressed laterite stone. There are two columns outside the citadel wall on the north-east corner of the mound similar to those found inside. They may be part of a ramp or a vestibule connecting the royal palace with another structure above the retaining-wall on the northern side. This will be known only when the encroachments are removed and further excavations are conducted there.

After the construction of these columns to the required height, a retaining-wall was constructed on all the four sides with a batter on the outer face and footings on the inner side to take the load and

act as a toe-wall to the filling. The outer face was plastered. On observation of the section facing west in ZB4, it is clear that the so-called citadel wall was raised from the floor level of Period II. Further, the bottom courses of the retaining-wall are well inside the plumb line at one end and they have come out at the other end in east-west orientation indicating that these are remains of an earlier wall. It is also observed in ZB4 that layers of earth are lying over the footings of the wall indicating that the inner portion was filled up after raising the wall. Originally the wall must be 7 m high from the ground level. Now the space between the retaining-wall and the foundation columns was also filled up and a flat area about 7 m high above the ground level with sloping walls on all the four sides was achieved. The actual palace was constructed above this flat area on a heavy foundation columns. Has the palace been constructed without laying these columns just by filling the area with earth it would have suffered settlement of foundations due to loose soil. There is a pathway all along the retaining-wall and access to the top of the mound of the palace was through a rectangular ramp on the southern side (pl. XXIII). One of the landings of this ramp still remains. The entrance excavated earlier is not piercing the retaining wall but perpendicular to it on its eastern side, allowing passage from north to south into the royal enclosure. One has to cross this door and walk all along the retaining-wall on the footpath and enter the palace after climbing ramp on the southern side.

A fact which cannot be ignored here is that there is a tank on the western side of the palace which was probably dug for making this artificial mound. Complete plan of the palace could not be exposed due to encroachment on the northern and eastern sides of the mound.

To Period-IV belongs the watchtower after the palace had fallen into disuse-. Sloping outer walls of tower was provided with steps on the northern side in the shape of a ramp. The tower portion was enlarged subsequently. This was most probably built during the Muslim period after the death of Raja Mukunda Deva in AD 1568. In the medieval period these were called *burz* and primarily meant for keeping watch for safeguarding the fort.

Antiquities from Period IV comprise sculpture of a female with a child on her left, and another female figure is standing, holding a bunch of mangoes in her left hand and a *chauri* in right on the other side (pl. XXII A-B). The lower portion of this figure is damaged. Another noteworthy sculpture is a small decorative pillar (pl. XXII C) with a base containing usual mouldings of *khura*, *kumbha*, *pata* and *kani* and a fluted shaft. The top as well as bottom portion of the shaft have dancing female figures in circular bands. The base from which the shaft rises also bears figures of squatting lions at each corner with a single head and two bodies in different planes. These two sculptures have tenons which will fit into the corresponding mortices in the recesses of the offsets of the temple wall portion (*jangha*). These are made of schist. Other sculptural fragments (pl. XXIV A) include mainly architectural and broken sculptures of *mithunas*. Coins of copper and potin (pl. XXIV B-C) were also found. These coins have Islamic characters on the obverse and reverse.

EXPLORATIONS AND EXCAVATIONS

65. EXPLORATION IN DISTRICTS KHURDA AND NAYAGARH.— B.K. Sinha of the Excavation Branch IV, Bhubaneswar, of the Survey, assisted by K. Veerabhadra Rao and N.K. Sinha, in the course of exploration brought to light the following sites.

<i>District</i>	<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Khurda	Banpur	Bhajagarh (19°55'45"N;85°25'50"E)	Medieval pottery
-do-	-do-	Chotrapur Sasan (19° 49' 12"N; 85° 17' 50"E)	Mesolithic (tools made on chert, quartz, agate and fluted core)
-do-	-do-	Harichandanpur (19°57'00"N;85°21'50"E)	Early medieval pottery
-do-	-do-	Kuhuri (19°52'20"N;85°21'50"E)	Medieval fort
-do-	-do-	Manglajori (19°54'55"N;85°25'40"E)	Medieval hero-stone
-do-	-do-	Rameshwar Hill (20°01'35"N;85°30'55"E)	Mesolithic (fluted core)
-do-	-do-	Salapdih (19° 52' 00"N; 85° 16' 17"E)	Mesolithic (microliths made on chert and quartz)
-do-	Khurda	Chhanagiri (20° 02' 42"N; 85° 29' 08"E)	Mesolithic (microliths made on chert, quartz, agate and fluted core)
-do-	-do-	Sablanga (20° 00' 32"N; 85° 36' 25"E)	Early medieval pottery
	-do-	Subalpatna (20° 01' 10"N; 85° 32' 45"E)	Mesolithic (microliths, fluted core, slow wheel-made pottery)
	-do-	Talpara (20° 00' 50"N; 85° 32' 35"E)	Early medieval pottery
Rajranpur			
Nayagarh	Rajranpur	Rajranpur (20° 03' 38"N; 85° 20' 35"E)	Medieval pottery

66. EXPLORATION IN IB VALLEY, DISTRICT SUNDARGARH. — In continuation of earlier work, S. Pradhan of the Department of History, Sambalpur University, along with the students discovered a new rock-shelter adorned with paintings in red and yellow and engravings of two deers (out of which one is executed upside down) in Sukhamankar in the reserve forest of Chhengaphar at a distance of about 3 km, north of Kanika (Hemgir Road Railway Station) in Hemgir tehsil. Three other rock-shelters in the locality also attest the fact that they had paintings in them as is evident on their weathered rock walls. The surface exploration of the rock-shelters and their surroundings yielded microlithic blades with workmanship either on one or both the sides, large quantities of parallel-sided blades of different sizes without any micro-touchings, points, blade-points, crescents, lunates, trapezes along with varieties of flakes, chips and cores of chalcedony and quartz. The other objects from the surface collection include hand-made potteries with mat impressions, wheel-made potteries of red and black wares with engraved patterns, hammer-stone and charred bones. By taking all these archaeological materials into account, the paintings and engravings in these rock-shelters from the style of their execution and preservation beneath a thin film of white patina may be attributed to the Mesolithic and early Neolithic period.

PUNJAB

67. EXCAVATION AT BRASS, DISTRICT PATIALA.—In continuation of previous year's work (1991-92, pp. 90-91), the Department of Cultural Affairs, Archaeology and Museums, Government of Punjab, Chandigarh, resumed excavation at Brass, a multi-cultural site, under the direction of K.K. Rishi, Kuldeep Singh Sidhu, assisted by Gurdev Singh, Pardip Singh, Hira Singh, Ranjit Singh and Madanjit Singh, to establish the sequence of cultures as also to ascertain a gap or overlap between PGW and the Harappan cultures besides to gather information about the cultural, religious, economic and socio-economic aspects of the Kushan period. Five different places (Sites 1,2,3,4 and 5) in different directions of the mound were taken up for excavation. Of these, the Sites 1,2 and 3 were already taken up for excavation during the previous years but the desired result could not be obtained due to the extensive structural activities as well as unfavourable weather.

These three sites along with Sites 4 and 5 were taken up for excavation during the year under review and a four-fold cultural sequence was obtained.

Though regular layers of the Harappan culture could not be traced in any of the sites mentioned above, yet the Harappan sherds appeared along with PGW and Black-slipped ware. The former were sturdy, thick and painted in black over a red surface with conventional designs. Some beads of faience were also recovered.

In the earlier levels at Sites 1,2,3, and 5, some sherds of PGW mixed with Black-slipped ware and early varieties of the Kushan ware were recovered. Some traces of post-holes in circular form were also exposed in Trench E, Site 1. But it is not certain, whether these belong to PGW or Black-slipped ware. Continuation of mixed sherds at Site 1 in El and Fl in early layers, i.e., 12-13 and at other sites, however, indicate the presence of PGW level at this mound. Recovery of terracotta pipe laid for drainage of water shows the standard of cleanliness they used to keep. The existing pipe is 1-30 m long. The drainage pipe was recovered at a depth of 6-16 m sealed by layer 14. Some antiquities like terracotta beads, wheels, balls were recovered. Lanes between houses were narrow.

This year's excavation was started in Trench EI and FI of Site 1 and three Trenches A1, A2 and XA1 were also laid out. Well-laid-out houses with corn-bins, hearths in different shapes and sizes, and successive floors of lime and *surkhi* were exposed. Five phases of a mud structure belonging to the Kushan period were also noticed. It is important to note that there were some congested houses as well as noticed at Site 2 where a cluster of rooms with common walls, twin *chullahs* and large-sized furnaces of big-sized burnt bricks made in circular forms was revealed. At Site 2, the houses were of mud-bricks (42 X 30 X 6 cm). While at Site 3, the Kushan houses having thin floors of mud, lime and *surkhi*, in Sites 4 and 5, those of burnt-brick were noticed. At Site 5, four joint corn-bins of mud-bricks, square in form indicating their use for storing the food grains were noticed, in addition to a burnt-brick well, largely disturbed, and encircled by a mud wall. The exact purpose of raising this mud wall is however, unknown. Another well (dia 3.35 m) was excavated earlier at Site 1. Trench EI was further exposed upto (twenty-three courses). The typical Kushan pottery comprising incurved bowls in different sizes, storage jars, basins, vases with sootmarks, dishes, etc., were recovered. Potsherds with stamp designs like *peepal* leaves, necklace, *nandipada*, etc., were noticed. Seals and sealings of terracotta with legends in Kharoshthi and Brahmi and copper coins were also collected during the excavations. Other notable finds included beautifully decorated painted and polished bone styluses in addition to the terracotta beads, balls, animals and human figurines, gamesmen, ear-studs, skin-scrubber, dabbers, bangles; shell bangles; copper and iron objects; beads of semiprecious stones; ivory dices and bone objects.

Excavation in Sites 4 and 5 revealed remains of medieval period in the form of potsherds, especially the knife-edged bowls, incense burners, kunali, glazed ware, bricks, terracotta beads, balls, animal figurines, bangle pieces and beads of glass. The upper layers were found in disturbed condition.

RAJASTHAN

68. EXCAVATION AT DONDER KHERA, DISTRICT DHAULPUR.— The ancient site of Donder Khera (26° 42' 00"N; 77° 45' 43" E) in tehsil Bari, approachable from Dhaulpur via Sarani Khera and from Bari via Mahuwa Khera, both partly *kuchcha* and *pucca* roads, was taken up for excavation by the Excavation Branch II, Purana Qila, of the Survey under Ram Saran. The ancient river Mendka used to flow close to the mound on the west but now remains almost dried up throughout the year except in the rainy season as a result of the construction of a dam upstream.

The approximate extent of the mound is 1200 X 1000 m. The cultural deposit lies over a large sand-dune. The total habitational deposit vary from 1 to 5 m owing to continuous erosion during the rainy season. The environment is similar to that of the ravines of the Chambal.

Close observation of the site suggests that different portions of the mound were occupied in different periods of time by different cultural groups. For example, the Chalcolithic and PGW habitations remained confined to the south-west side of the mound while the later peoples shifted towards the north-east and east. The finds of sculptures suggest that it was an important centre of Jainism too although some fragmentary images of Brahmanical deities were also noticed. The site was occupied during the Muslim period as well.

A small-scale excavation was undertaken to know the cultural sequence of the site. Three trial trenches were laid at three different parts of the mound.

A trial trench measuring 10 X 10 m was taken up in the southwestern end of the mound (DNK -1) to know the cultural sequence of the mound. In all eight layers were exposed. In Qd 4 on the eastern side natural soil was touched at a depth of 1.21 m. Layer 8 consisting of compact earth yielded Chalcolithic black-and-red ware potsherds (free from PGW) while layers 7 and 6 yielded a considerable number of PGW sherds in association with black-and-red ware, Black-slipped and associated red wares. Layer 6 is sealed by a mud-rammed floor giving an outline of a circular hut, probably made of wood as a series of post-holes in circular fashion would indicate. A sickle lying closer to a fire-place (probably a *bhatti*) was also discovered in this level. Contemporary to this floor is layer 5 with ashy clay followed by another thick mud-rammed floor along with layer 4. Layer 2 is partially visible. Layer 1 is found to be considerably eroded because of the slopy nature of the mound at this point.

Qd 1 was also taken up for digging upto layer 7. All the layers were almost identical showing uniformity throughout. The most interesting feature was the impression of a circular hut (layer 5). The floor yielded hand-made brick-shaped cake (over-oxidized) arranged in a row. Special feature of this trench was that a number of human bones as well as those of animals, encountered from each and every layer.

As pointed out earlier the lower strata measuring approximately 20 cm in thickness yielded black-and-red ware pottery associated with coarse red ware and Black-slipped Ware and the shapes included dish and bowls in the first two wares and globular vases in the coarse red ware treated with mica dust in some cases. The upper strata (layers 7 to 1) yielded PGW associated with all the previous wares. The common shapes in PGW, black and red and Black-slipped Ware were dishes and bowls while jars, vases, water pots and small miniature pots in red ware and coarse red ware. The decorative motifs of PGW comprise oblique and parallel strokes, concentric lines, dots, loops with dots and mat designs.

Antiquities from the excavation include some terracotta *ghata-shaped*, arecanut, and a simple variety of beads in addition to two carnelian beads and a faience bead. Besides, iron nail, copper-ring, terracotta gamesmen, sling-ball, weight and bone objects are also noteworthy. A seal, probably of the Gupta period, was found in a pit from PGW level.

As the Trench DNK-1 did not yield a complete sequence, another portion (DNK-2) of the mound at the northeastern fringe, close to the river, was selected for digging which showed some structural activity and therefore another trench (measuring 10 X 10 m) to the north of it was also laid to know further about the structures. In Qd 1, the natural soil was touched at a depth of 1.48 m. Three different phases of structural activity were met with.

Structure-1 (STR-1, measuring 1-40 x 1-30 m) was traced in the southeastern corner of the quadrant at a depth of 24 m. Four stone slabs, fastened by iron clamps to form a squarish structure filled with brick-bats mixed with earth, tends to suggest that it was a platform. Another structure, elliptical in shape and associated with the STR-1 evidently was used as a fire-place as the signs of burning was still evident. To the north of the squarish structure was traced a big pot with a smaller one inside, probably for storing water for religious use. Contemporary to some stones lay to the further west.

At a depth of 29 m and to the north of STR-1 was encountered an almost squarish structure STR-2, in two courses, measuring about 1.40 X 1.30 m, which appeared to be a platform or a pillar base.

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Here again, a pot abutting the structure is placed in the north. The structure is sealed by layer 2 which comprised compact greyish earth.

A brick structure (STR 3), probably a wall in three courses, running almost parallel to the western section, joined another wall at right angles with six courses in the northern baulk in the east-west orientation, built of reused bricks and stones. The average length of the bricks varied from 32 cm to 36 cm and width from 20 to 22 cm and thickness from 6 to 7 cm. The structure, sealed by layer 3, rested on layers 5 and 6 is the earliest deposit. In Qd 4, the layer natural soil was touched at a depth of 8 m wherein were noticed three structural activities. Structure (STR-1), measuring 2-30 x 1-90 m, is a platform-like structure of stone, while structure (STR-2) is a brick one forming a gallery-type space filled in with broken bricks of the Gupta period. The earliest structural activity was noticed in the shape of brick flooring at a depth of 66 m: the brick sizes being what were found in STR-3.

Pottery from this deposit comprised red-slipped ware, stamped-pottery and coarse red ware. The types included footed-bowls, sharp-edged bowls, vases, dishes, miniature vase, carinated *handi*, storage jars, etc. Among the antiquities, mention may be made of images of Ganesa and the Jaina deities; terracotta and stone hopscotches, a copper bangle piece, iron knife and a fragment of a stone sculpture. No datable antiquity could, however, be brought to light. Although the earlier remains could be assignable to the pre-Gupta period, the site remained under occupation till the early medieval period.

69. EXCAVATION AT BALATHAL, DISTRICT UDAIPUR. — The excavation at Balathal was undertaken jointly by the Department of Archaeology of the Deccan College Post-graduate and Research Institute, Pune, and the Institute of Rajasthan Studies, Rajasthan Vidyapeeth, Udaipur, under the direction of V.N. Misra of the Deccan College. Other participants in the excavation were V.S. Shinde, R.K. Mohanty, M.D. Kajale, P.K. Thomas, P.P. Joglekar, Malti Nagar, Anupama Kshirsagar, Rukshana Nanji, A. Mishra, K. Dalai, S. Kadgaonkar, technical staff members of the Deccan College, and Lalit Pandey and J.S. Kharakwal of the Rajasthan Vidyapeeth.

Balathal (24° 43' N; 73° 59' E), a village in tehsil Vallabhnagar, is located 42 km east of Udaipur city and is reached from Udaipur by the Udaipur-Chittorgarh highway and a small road which branches off from the highway, 1 km east of Dabok airport. Vallabhnagar town is about 6 km to the south-east of Balathal. The archaeological site, consisting of a prominent mound, is located on the southeastern fringe of the village. It measures about 145 m north-south and about 140 m east-west, and has a height of 7.15 m from the surrounding ground level. The central part of the mound, roughly 90 m north-south and 80 m east-west, is well preserved while a large area on the periphery was badly disturbed by digging and ploughing.

Balathal (fig. 28) is one of the nine Chalcolithic sites discovered by V.N. Misra in the course of a survey in Mewar in 1962-63. During surface examination, it had revealed typical pottery and other antiquities of the Chalcolithic Ahar culture. The pottery included, among other ceramics, typical sherds of sturdy late Harappan ware.

The site was chosen for excavation because of its fairly large size, considerable thickness of the habitation deposit, good state of preservation and easy accessibility from Udaipur. The main objectives of the excavation were: (a) to ascertain the pattern of culture of the first farmers of Mewar beyond what

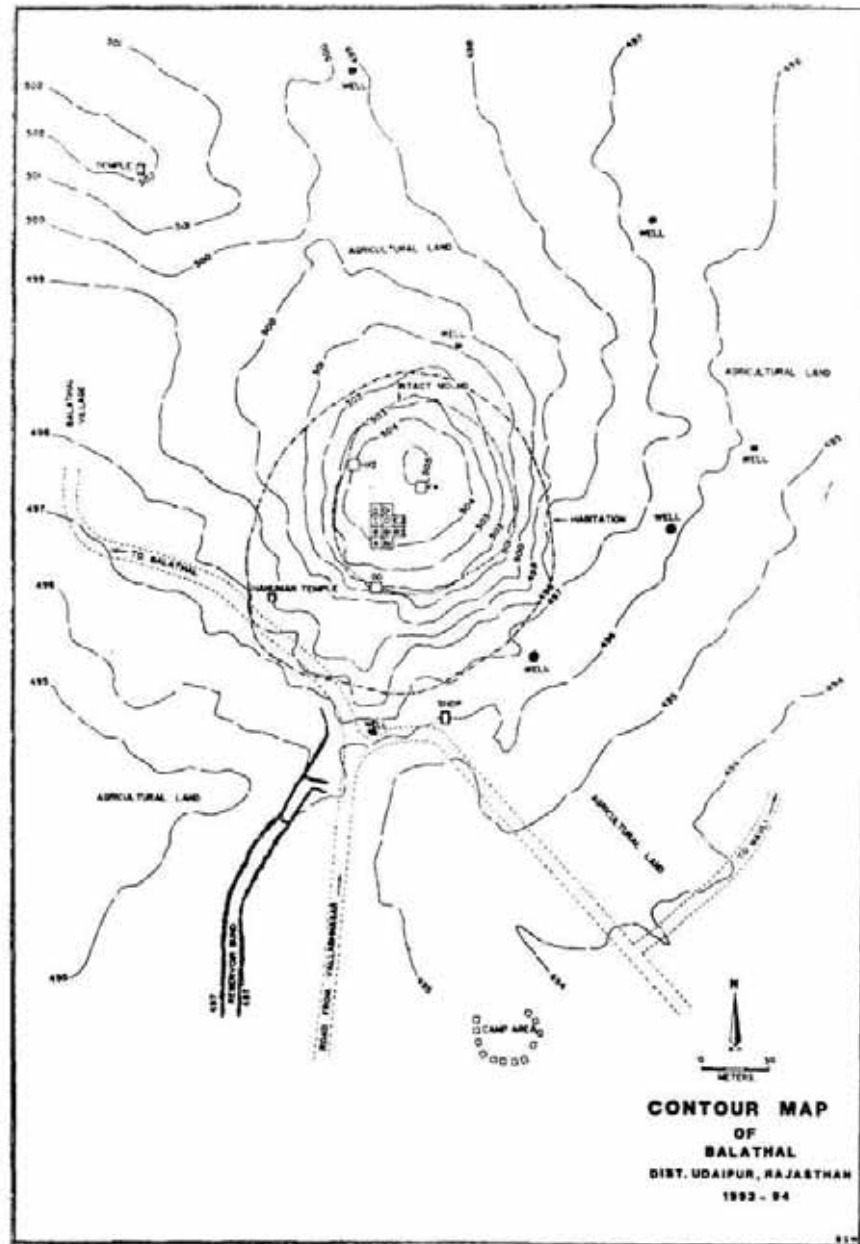


FIG. 28.

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was known from the excavations at the sites of Gilund and Ahar; and (b) to elucidate the nature of relationship between the Ahar culture of Mewar and the late Harappan culture of Gujarat.

The entire area of the intact part of the mound was put on a grid of 5 X 5 m trenches. Ten Trenches (A, AI, B, BI, B2, C, CI, C2, and D, DI), covering an area of 250 sq m, were selected for digging in the southcentral part of the mound. Trenches A and AI were, however, abandoned after preliminary digging and work was concentrated in the remaining trenches. Besides, three trial trenches, F4, HX 2 and OD, were taken at different parts of the mound to ascertain the nature of cultural sequence and horizontal and vertical extent of the deposit of different cultural periods.

Trenches B, C and D were dug to a depth of 1.60 m, Trench F4 to a depth of 7-60 m, Trench HX 2 to a depth of 3.70 m and Trench OD, located on the southern slope of the mound, to a depth of 4- 10m. The stratigraphy, primarily as revealed in Trench F4, has enabled us to identify the cultural periods represented at the site and to determine the thickness of their deposits.

Period I. Chalcolithic (layers 14 to 22 ; deposit 3 m)

Period II. Early historical (layers 1 to 12 ; deposit 3.40 m)

Layer 13 is sterile, suggesting a break between the Chalcolithic and early historical periods

Four coins belonging to the early medieval period were found on the surface of the mound. Since there is no stratified deposit of this period at the site, the coins may represent a transitory occupation during this period.

Early historical period, with a deposit of 3.40 m, had a long occupation. It yielded a variety of material remains, comprising structures, pottery, iron smelting furnaces, iron and copper objects, beads, bangles, terracotta objects, coins and a ring-well (pl. XXV A).

Substantial evidence of structures of this period was found in the main excavation area as well as in Trench F4. The excavation in the main area revealed remains of the walls of a rectangular structure of which only the basal part has survived. They were constructed by using stone-slabs of uneven size and shape, joined with clay mortar. The floor, which is badly disturbed by later pits, was made of brown earth, rammed hard and plastered with mud. Below this structure, a large L-shaped rectangular structure was partially exposed. It consists of two sets of parallel walls, one outer and the other inner, separated from each other by a gap of 2 m. Both sets consist of two walls each one running north-south and the other east-west. The north-south section of the outer wall had a length of 12 m, a width of 1.50 m and a height of 30 cm and the east-west section had a length of 14.50 m, a width of 1.50 m and a height of 30 cm. The north-south section of the inner wall had a length of 8.50 m, a width of 1.05 m and a height of 30 cm and the east-west section had a length of 10 m, a width of 1.50 m and a height of 30 cm. At its southeastern end, the outer wall, only partially exposed vertically, was sloping outward from the top, like the wall exposed in Trench F4 and described below.

This structure is sealed by layer 4 which has an average thickness of 25 cm and is formed of a white ashy material. In Trench F4, separated from Trench D2 by a distance of 5 m, a massive and high stone-wall was partially exposed. It appears to be an extension of the large L-shaped stone structure

exposed in the main excavation area. This wall has a length of 5 m (east-west), a width of 1.3 to 1.5 m and a height of 3.35 m. The southern face of the wall slopes outward towards the base. Three 1 X 1 m sondages, taken at intervals to the east of this wall, show its extension for 11 m. Taken together, the walls in the main excavation area, Trench F4 and the sondages, seem to represent a large fortified structure, similar to the medieval fortified residence of the Rajput chiefs in Rajasthan.

Trenches HX 2 and OD did not yield any substantial evidence of structures probably because of their location on the periphery of the main habitation area and small size.

The early historical period yielded a variety of objects like beads, glass bangles, semiprecious stones like carnelian, banded agate and jasper, steatite, paste, shell and terracotta, terracotta objects including circular lamps, tabular weights, long conical objects, slender sticks, probably used as kohl-stick, skin rubbers with punctured surfaces, a number of perforated, unperforated tubular ear-studs with slightly concave surface, animal figurines of bulls and a large tortoise, a number of iron objects including nails, arrow-heads, spear-heads, door-clamps, adzes and bells, a couple of copper coins, copper bangles, a ring, wire-fragments, part of a tweezer and a number of stone objects including saddle querns, hammer-stones, mullers, pounders, a rotary quern and sling balls.

A tiny piece of cloth (pl. XXV B) was found in one of the pits in the early historical levels of trench HX 2. The pit was located in the south-west quadrant and was sealed by layer 8. The material is cotton and the weaving pattern is in matting technique. Stratigraphically, it could be dated to the beginning of the second century *EC*.

In the baulk between Trenches F6 and G6, a small sondage was taken to trace the continuity of the massive stone wall found in Trench F4. At the base of layer 1 was exposed a ring-well (pl. XXV A) having seven terracotta rings. The diameter of the topmost ring is 68 cm and that of the successive rings is slightly larger. The height (28 cm) of the rings is uniform. The total height of the exposed part of the ring-well is 1.42 m. The ring made by piling coils one above the other and their thickness varies from 3 to 3.5 cm. Such ring-wells served as soak-pits for draining waste water in the early historical period in north India.

The pottery of this period consists of red, black and grey wares. It was made on fast or slow wheel or by hand. It is thick, coarse, ill-fired and contains a lot of tempering materials like sand, mica, plant fibres and rice-husk. The pottery shapes are similar to those being used today in the villages around the site. They are varieties of huge storage jars, basins, big globular pots (*matka*), *lotas*, bowls, dishes with handle, lids and spouted pots. Some of the lids are perforated and have knobs/finials. A few pots have sharp carination.

The Chalcolithic level was reached only in the trial trenches in a limited area. The maximum deposit of this period, about 3 m, was recorded in Trench F4 in which two structural phases were noticed. The later phase is represented by a stone wall of which the upper part is made of mud and mud-bricks. This wall was exposed just below the early historic fortification wall to a length of 5 m. The stone foundation of this wall had a width of 70 cm. Another stone structure was found in layer 18 along the southern section of the south-east quadrant.

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The basal part of another structure was uncovered in Trench OD. It consisted of a stone wall, with an average width of 1.10 m, which was traced to a length of 5 m north-south. It had a solid foundation with six courses of dressed stone slabs joined with clay mortar. Adjacent to this wall a mud-brick platform was found.

As the exposed area of the Chalcolithic deposit was limited, no significant material remains, except pottery (pl. XXV C), animal bones and querns, were found. The pottery of this period can be broadly divided into fine and coarse varieties. There are six wares in the fine variety, identified on the basis of surface treatment, decorative pattern, thickness and firing technique. They comprise thin and thick red-slipped; Kayatha; tan-slipped; black-and-red painted in white and Reserve-slipped wares.

Among these wares, the tan-slipped one is of special significance because of its close similarity with the late Harappan painted ware found in Gujarat. It is made of well-levigated clay on a fast wheel and is uniformly fired to a high temperature. The external surface bears a light chocolate colour slip which, at some places, has turned into dark chocolate or blackish, possibly due to firing conditions. The basic difference between the tan ware and the late Harappan painted ware is that the former is plain whereas the latter is painted in black colour. The most important types in the tan ware are dish, dish-on-stand, large convex-sided bowl with thick rims, globular pot with beaded or flat projecting rim and large basins with ledges on their necks. There are a number of specimens of perforated pots in this ware which are similar to those found in the Harappan culture. The presence of a number of Harappan shapes in the tan ware is suggestive of a contact between the early settlers at Balathal and the late Harappan people of Gujarat. It is very likely that the earliest farming settlements in Mewar were established by the late Harappan people who migrated there from Gujarat.

The coarse variety is represented by three distinct wares, namely thick red-slipped, coarse grey, and coarse red wares. The first two wares were of slipped variety whereas the third one is unslipped. The thick red-slipped ware is represented mostly by medium to large globular pots with incised or punctured decorations like wavy, vertical and horizontal lines, criss-crosses, and diamonds appearing on the shoulders.

A preliminary study of the animal bones of the early historical levels, mainly from Trench HX 2, by P.K. Thomas, P.P. Joglekar and Seema Pavankar revealed the existence of the following animals: domestic animals, cattle, sheep, goat, pig, horse and dog; wild animals, *gaur*, *nilgai*, blackbuck, *chausingha*, *chital*, *sambar*, wild boar, mongoose, hare, porcupine, rat, elephant and small ruminants; birds and aquatic creatures, peacock, pea-fowl, fowl, turtle, fish and molluscan shells.

Cattle, sheep and goat bones account for the bulk of the faunal collection, suggesting a dominant role of animal husbandry in the economy of the settlement. Bones of wild animals are relatively scarce but their number increases in the lower layers of the deposit of this period. Among the wild animals, antelopes are better represented than deer.

It can be stated, on the basis of C14 dates from Ahar, that the Chalcolithic culture of Balathal flourished between 2100 and 1400 BC while the early historical culture started, after a gap of several centuries, around third century BC and lasted possibly up to the third century AD.

TAMIL NADU

70. EXPLORATION IN DISTRICT CHENGAI M.G..R. — The Department of Ancient History and Archaeology, University of Madras, under the direction of K.V. Raman, assisted by the staff and students, explored Tiruverkadu in taluk Sriperumbudur and Kuvam in taluk Tiruvellore of District Chengai M.G.R.

At Tiruverkadu, the river Kuvam cutting across an archaeological mound was noticed. Upto a distance of one km, the river bund displays habitation deposits in cross-section. The thickness of the deposit was about three metres from the river-bed. It contains a number of potsherds like black-and-red, red-slipped, black, orange-slipped and coarse red wares. A few broken conical jars identifiable as the imitated amphorae like those found at Arikamedu datable to the first century AD were also collected from the deposit. Besides, quartz beads, iron slags were also obtained during the exploration. At two places, ring-wells were noticed. In one of these, six rings were observed.

At Kuvam, a mound called Uppunarmedu covering an area of about 2 acres and having a height of 1 -5 metres was noticed. On the surface of this mound the black and red, red-slipped and coarse red wares were collected. Besides, at two places, ring-wells were noticed. One of these wells had five rings.

71. EXPLORATION IN DISTRICT CHENGAI M.G.R.—Exploration was carried out along the Kortalaray river in the villages of Erumaivettipalayam, Anaikattu, Karandai and Pagalmedu to study the river terraces by the Prehistory Branch of the Department of Archaeology and Museums, Government of Tamil Nadu. Of these, only the first-mentioned village yielded four river terraces. As far as artefacts are concerned, only a single Palaeolithic tool was collected from a mound situated at a little distance from the river course in Erumaivettipalayam.

72. EXCAVATION AT PADAVEDU, DISTRICT TIRUVANNAMALAI-SAMBUVARAYAR. -- The Department of Archaeology and Museums, Government of Tamil Nadu, under Natana Kasinathan and A. Abdul Majeed, conducted excavations at Padavedu which revealed two types of brick channels and a granite one. The brick-made ones showed advanced technique of construction that was adopted during the thirteenth-fourteenth century AD. While the granite channel appeared to be an open type, the brick one was a closed type. One of the brick-channels showed a brick at the bottom and the top with two bricks on either side. The other brick made channel was constructed with five courses of bricks, placed one above the other due to which, the breadth of it increased progressively towards the bottom. Antiquities include four copper coins, blowpipe, crucible and a few pieces of bangle. Of the two debased coins, one belonged to Vijaya Rukkaraya II and the other to Sri Devaraya I of Vijayanagara dynasty.

73. EXCAVATION AT GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR. — The Madras Circle of the Survey under the direction of B. Narasimhaiah, assisted by P.S. Sriraman, R. Manikkam, V. Sarangadharan, K. Kalaiselvan and S. Ashok Kumar, carried out excavation in the Royal Enclosure (inner fortification) with a view to exposing the structures and understanding the plan of the citadel as well as phases of structural activities.

During this season, a mound measuring about 80 m north-south and 70 m east-west, located in front of the Kalyana Mahal, a seven-storied pleasure pavilion located within the enclosure, was taken

up for operation. Earlier clearance work in the mound revealed the existence of a massive enclosure wall and a lime-floor indicating the existence of a large structural complex of considerable importance.

The excavation during this season, limited to about 1600 sq m of the mound, revealed two structural phases *viz.*, I and II. During phase I, there were two structures (1 and 2) enclosed by a massive enclosure wall. During the second phase, within the same area, a new structure, STR 3, was raised above the debris of STR 1 and another structure, STR 4, was also built. In addition, STR 2 of the earlier phase remained under use. Thus, three structures *viz.*, STR 2, STR 3 and STR 4, were under use in phase II of the complex. One of the characteristic features of the structures of phase I was the use of combination of ashlar masonry for the bottom portion and brick masonry for the top portion of the walls, a feature that is common to all the Nayaka buildings in Gingee. On the other hand, the structures built during phase II, i.e., STR 3 and STR 4, were of poor constructional quality as rubbles, concrete chunks of roof of the earlier buildings, bricks and brick-bats were reused freely without any order. Therefore, phase I may be dated to the Nayaka period, i.e., *circa* sixteenth-seventeenth century, if not earlier, whereas the phase II may belong to *circa* seventeenth-eighteenth century, when Gingee was subjected to protracted warfare.

Of the two structures of phase I, STR 1 is located in the eastern portion of the complex, whereas STR 2 occupies the western one. STR 1 consists of a rectangular room oriented north-south, a well with two adjacent rooms, all aligned from east to west direction and a L-shaped room. The room, oriented north-south, measuring 13.10 m X 4.65 m, was interestingly bifurcated by constructing a cross-wall rendering the southern portion without any access. In addition, there are remains of three pillars (0.90 m square) in a row and the cross-wall running across in-between the second and the third pillars, possibly at the place of a pillar. The possible reason for constructing this cross-wall was perhaps to save the roof from total collapse as the roof was composed of 0-30 m thick lime-concrete.

The well is an interesting structure. It measures internally 3.85 X 3.60 m and has a depth of over 9 m. This well has a flight of steps along two sides originating from an entrance. The flight of steps was supported by a thick masonry over a wooden beam. The joints of the ashlar masonry of the walls of the well were well pointed in lime-mortar upto a certain depth and below it they were not pointed obviously to allow free movement of ground water. Adjacent to the well were two rooms providing access to the well.

The L-shaped room (13.75 X 11.80 m) has a platform (3.30 m wide) along the enclosure wall. There is a closed drain at the northern end of the platform.

A complete plan of the whole structure could not be obtained due to disturbance while constructing STR 3.

STR 2 was only partially exposed during this season. However, this structure seemed to be an important one in the complex as it was oriented axially towards the Kalyana Mahal and its plinth was found to be moulded.

The excavation revealed two alignments of the enclosure wall. The inner of the two alignments, preserved to a course only, was slightly curved. It seemed that the wall was dismantled and reconstructed just to rectify the curve, an event possibly happened in the phase I itself.

STR 3 seemed to be a large structure consisting of residential units comprising rooms integrated with two open lime-floored quadrangles surrounded by closed verandahs. A comprehensive plan of the structure was yet to be obtained. Similarly, STR 4 was also exposed only in part.

The antiquities from this season's excavation were restricted to a few iron objects like nails, door-parts, etc.

UTTAR PRADESH

74. EXCAVATION AT MEHTAB BAGH, DISTRICT AGRA. — The Agra Circle of the Survey carried out scientific clearance of the Mehtab Bagh under the direction of P.B.S. Sengar, assisted by P.K. Sharan, G.N. Srivastava, O.D. Shukla, R.K. Tiwari, Y.P. Agarwal, S.K. Kulshreshtha, C. Lai, C.P. Singh, Y.K. Sharma, R.S. Balodi, N.P. Srivastava, Prem, Sriram and others.

This Mughal site located opposite the Taj Mahal on the left bank of river Yamuna, now badly silted by river floods, is a large quadrangle, once surrounded by a regular boundary wall with corner kiosks of which only the southern side with a kiosk at its eastern end now survives. The ruins of the western kiosk is faintly traceable now. This side of the boundary wall measured approximately 289 m.

To expose the structures buried under the silt, thirty-one trenches of 10 X 10 m each were laid out in the extreme southern portion of the site near the centre of southern wall (pl. XXVI). In the clearance work, a grand tank of octagonal shape was exposed. One side of it measured 17.45 m along the inner face. Thus, the total (interior) area of the tank was calculated as 1469.7896 sq m. The tank consists of *pucca* bottom, elaborate embankment, a fountain system and outlets and pavilions on the southern side.

The bottom of the tank was built with laying of the brick courses superimposed by a 30 cm thick layer of lime concrete. At the bottom, traces of repairs were also noticed. The embankment was found 11-70 m wide. Originally, the embankment was 4.30 m while an additional wall having width of 7.40 m was raised in the second phase. From the top surface of this embankment, the depth upto the bottom of the tank was 1.19 m. It was noticed that the interior face of the embankment was raised in two terraces. The first terrace was 50 cm high with plain face. On plan, this terrace was 85 cm wide, the second terrace begins at this receding end. It is 69 cm high and the face is broken into cusps. On plan, each side of the octagonal tank was arranged with sixteen pentafoiled arched forms upto a height of 56 cm.

On plan, this arched portion was extended to a width of 88 cm. To the back of the arched portion, a stone kerb of 13 cm (height) by 50 cm (width) with moulded front edge formed a running border all around. This stone border extended towards back by a platform of 5.07 m width all around with plastered surface (this plan and elevation was found fully intact only on the southern side). On the southern side, the plan of pavilion attached to embankment platform and consisted of a central *dalan* flanked by a closed chamber on either side, was found extending all along the length of the one side of the octagon.

At the bottom of the tank, finds of the number of pitmarks and fragments of marble-shafts with vertical holes suggested the existence of spring fountains in the tank in a planned geometrical distribution. The digging of a pit revealed that a circular pit was built of *lakhauri* brick in lime mortar for installing a fountain shaft. The diameter and depth of the pit were 1.14 m and 1.84 m respectively.

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At the lower level of the pit, a pipe-line of glazed terracotta was found running in two directions which suggested that each fountain was interconnected with others by pipe-lines. The bottom of the well had a smaller pit of concave shape. It was tightly covered by a stone-slab which had a socketed hole at the centre to retain the vertical pipe of marble. The tallest fragment of marble pipe was 49 cm high, which was like a pillar. The base of the pipe was square on plan and the shaft was eight-petalled. The diameter of the hole of the pipe was 10 cm at the base while the tapering shaft was 7 cm.

To drain out the excess water released by the fountains, there were outlets at the bottom of the tank as noticed on the north-east, north-west, south-east and south-west sides.

The architectural fragments similar to those of the southern pavilion were also found on the northern side of the tank thereby suggesting the existence of a similar pavilion on the northern side as well.

The architectural fragments suggested the Shahjahani style of architecture.

75. EXPLORATION IN DISTRICT AGRA. — G.N. Srivastava and O.D. Shukla, assisted by S.K. Jain, R.S. Balodi and Sri Ram, under the direction of P.B.S. Sengar of the Agra Circle of the Survey, carried out explorations in the Batesar area of the Bah tehsil in District Agra.

Batesar 2 (26° 57' N; 78° 32' 30" E) lying on the right bank of river Yamuna, is an old village which is located about 72 km south-east of Agra. In this area, the river Yamuna flows in a serpentine course forming circular loops-ox-bow lakes. The local drainage has formed an intricate series of ravines.

Batesar was a prominent religious centre during the late medieval period. Atleast thirty-nine temples were built here on the right bank of the river Yamuna during the reign of the Mughals under the endowments of chiefs at the Bhadawar estate having its headquarters at Bah and Hatkant. They also had a fortress at Batesar which is said to be the religious capital of the estate. The fortress is now in badly ruined condition and totally abandoned.

The fortress facing east was built with bricks set in mud mortar. In the core of the walls, brickbats were piled with mud mortar while the veneering was done with complete bricks with fine edges. The bricks used in this fort are mainly of two types (i) the *lakhauri* bricks and (ii) the Kushan bricks (42 X 25 X 7 cm). The proportion of the *lakhauri* bricks was very less as they were confined only to the high arched entrance of the fortress while the Kushan bricks were used lavishly as those were perhaps easily available in that area.

In the course of exploration, several sections of habitation were examined. The cultural assemblage consisting of the Maurya and the Kushan pottery (particularly bowls) were noticed inside the fort complex and also in the adjoining area. In a section on the northern end of fortress (facing towards the house of the Jayadalal Sharma), a few brick-courses of the Kushan bricks (measuring 47 X 7 cm and 52 X 26 X 7 cm) were noticed stratigraphically lying below the foundation of the fortress. Similar brick-courses were also noticed at many other sites which were exposed in the sections of ravines. The site witnessed a rich settlement during the Maurya-Kushan period.

The sections falling on the way to Rajmata *tila* (also known as Sursen *tila*) are notable for the assemblage of grey and red wares of PGW fabric along with Black-slipped Ware apart. At *Goldanda*

area, no section was available but tiny potsherds were noticed profusely on the surface. At the top of this mound, a ruined gate of *Gusainyo-ki-haveli* stands majestically although the *haveli* itself has since been completely wiped away. This edifice was constructed by reusing the Kushan bricks.

Chamundapahar is separated from *Goldanda* by a deep *nulla* where some brick courses of the Kushan period were noticed *in situ*. The sections also yielded the potsherds of the typical Kushan period.

At a site near the old bed of the river Yamuna, a *Siva-linga* having anthropomorphic face (*eka-mukha*) was noticed. Stylistically, it appears to belong to the post-Gupta period. The deity known as Yanakandesvara Mahadeva enshrined in a small temple, the floor of which was found is now much below the surrounding ground level.

Besides some stray sculptures and terracotta figurines, stylistically representing the Kushan, Gupta and post-Gupta types were found placed *pathvaris* (places of folk worship).

The Digambar Jaina temple at Batesar was built in *samvat* (Vikrama) 1839. This is a *sikhara* temple added with a big *dharmashala*. A large number of sculptural fragments and detached architectural members of temples datable to the early medieval period, collected from the site are now preserved in a hall called museum.

There are also some very fine sculptures kept in the sanctum of the temple. A stone image of Neminatha enshrined in the temple contains one line inscription in Devanagari which refers to the reign of Paramardideva (the Chandela king) and the date reads *vaisakha, badi soma of Vikrama-samvat 1224*. An inscribed stone image of Santinatha also refers to (Vikrama) *samvat 1140*.

At Shauripur, about 3 km from Batesar, there is a hamlet where a ruined brick structure appeared to be the base of some early medieval temple.

As already stated, a series of temples are found in a picturesque setting on the right bank of Yamuna. Most of the temples are of *chauburji* type having a domed-roof and corner turrets, all constructed with bricks in lime mortar with plastered surface and white-washed exterior. Some of these were painted with beautiful motifs in the interior. Except for a few buildings which are called *kunja* (constructed in palanquin vault), in all the temple edifices the semi-circular dome of horizontal courses is supported by the corner squinches. The temples of Narmadesvara, Chhote Bihari Ji, Bade Bihari Ji (Raja Bihari Ji) and Patalesvara form a distinct line of architecture in plan and elevation. Though internally built in similar constructional pattern, the exterior contains a tapering *sikhara*. The presence of *anga-sikharas* suggests that the builders possibly tried to simulate the temples of *bhumija* style. The temple of Gauri Shankar Ji has a stellate plan of sixteen angles. The temples of Patalesvara and Bade Bihari ji are notable for gorgeous *mandapas* in front of the sanctum. The former is beautifully painted.

Some of the temples of Batesar contain inscribed stone tablets bearing inscriptions in the Devanagari script of the late medieval period, which refer to the name of the builder and the date of construction, etc. An inscription in the temple of Panchamukhesvara mentions the name of the builder as *Maharajadhiraja Sri Maharaja Aniruddha Singh ji Deva* and the years *samvat 1792*. Another temple

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known as Sri Ramesvar ji bears an inscription which describes the temple as built by Kuanri Sri Maharani Badi Seshavriti devya ju in the reign of *Maharajadhiraja Sri Maharaja* Mahendra Vasati Singh Bahadur Devaju. It also mentions the name of an officer or daroga named as Jagat Singh and a stone cutter or mason (*sanga-tarasha*) named as Devakant. The year of construction is given as *samvat* (it is Vikrama *samvat*) 1838 and Saka *samvat* (mentioned as Saka) 1703.

The life-size sculpture of Gauri-Sankara, enshrined in the temple dedicated to them, bears an inscription which records the date of installation of the image in the *samvat* (Vikrama) 1819 *vaisakha sudi* 13 in the sovereign reign of Alamshah under the rule of (subordinate *raja*) *Maharajadhiraja - Sri Maharaja* Vasant Singh ju Deva by Sri Rani Badi Sisodiniju. It mentions the name of the sculptor as Ghasiram.

Apart from the temples, a number of ruined and abandoned buildings exist at Batesar which belong to the late medieval period. In these constructions, the bricks of the Kushan period were reused profusely. These buildings are being called *havelis*. Some of them were known as *Gosainyon-ka-Akhada* while others belonged to the officers of Bhadawar estate and rich traders. There were some buildings also owned by the Marathas according to the local tradition.

76. EXCAVATION AT JAINAL-NAULA, DISTRICT ALMORA. — The Department of History including Ancient Indian History, Culture and Archaeology, HNB Garhwal University, carried out excavation at Jainal-Naula under the direction of B.M. Khanduri, assisted by Vinod Nautiyal, R.C. Bhatt, K.S. Negi, J.S. Rawat, J.S. Negi and G.P. Bahuguna.

The excavation at Sanana falling in the Jainal-Naula complex, located at a distance of 10 km northwards of Bhikyasen, revealed two types of burials *viz.*, dolmenoid cist-and urn-burials. These exhibit more details about the nature and location of burials, their orientation, layout as also the funerary remains. Five cist-burials were exposed during the excavations (pl. XXVII A). The cist-chambers consist of three to six shale orthostats placed vertically upright according to the requirement. All the cist-chambers were rectangular on plan with a required number of cap-stones covering the box-like structure. The measurement of cist varies from 1.95 X 0.56m, 1.87 X 0.50m to 1.05 m X 0.45 m which contained pots, human bones, teeth and a bead. On the surface of the chamber, there were shale slabs on which the remains of the dead body and funerary material were placed. Most of the cist-burials were placed in east-west direction but some were also laid in north-north-east and south-south-west and in north-south directions. The excavation also revealed that these burials were assembled after a pit was cut out in the hard gravel bed of the river. The rectangular box-like structure with upright orthostats was fixed on this groove created in the hard bed followed by the use of gravel, small pebbles and soil for the packing material and the cap-stones on the top of the burial. A notable aspect noticed here was that almost every cist-chamber was covered all around by a rectangular or semi-oval protective wall of boulders. They also used small stones, rubble and soil on the top of the burial as a protection. The megalithic people of Kumaon also put upright stones on the corner of each cist as an indicator of these burials.

Most of the burials contained tiny fragments of human bones, jaws, teeth and pots of various sizes. In Cist-1 (SNA-3), twenty-four human teeth along with a bead of banded agate were kept in a bowl

with pedestal base. Similarly, in Cist-2 and Cist-5 (SNA-3), human teeth, jaw and pots were discovered inside the chamber (pl. XXVII B). The nature of the discovery of human remains undoubtedly suggests that, before interment of the mortal remains, the dead body was first exposed to excarnation and the left-over portion was then given the ritual of a burial. Due to an acidic soil, most of the bones are highly disintegrated.

Another characteristic find at Sanana (SNA-3) is a group of urn-burials. Total area excavated in SNA-3 is 7.55 m X 3.10 m which yielded remains of cist-burials and urn-burials. As already indicated, almost every cist-chamber was covered by a rectangular or semi-oval protective wall. In general, the urn-burials were laid outside the periphery of this protective wall. Six urn-burials 1,2,3,4,5, and 6 were laid on the side of the protective walls of the cists. All the urn-burials were of same period and bear similarity to those found in earlier excavations (1991, 1992 and 1993) at Baseri. At Sanana (SNA-3), the large-sized hand-made jars (55 cm diameter) contained mat-impressions or ripple-marks. Another type of pot-burial is sturdy or coarse red ware and black ware.

A variety of pottery represented by dishes, bowls, miniature bowls, vases and bowls with pedestal base is the characteristic feature of these burials. The fabric ranges from coarse red to a fine wheel-made red and grey wares. The shapes in dishes and bowls mostly akin to those of the PGW are comparable to those found earlier at Hastinapura, Ahichchhatra, Thapli, Jakhera and a few other PGW sites in the Ganga-Yamuna doab. The Sanana-Baseri ware could be placed anterior to the mature PGW types. Similarly some pottery shapes are very much comparable to the ceramics found in the cemeteries of the Gandhara Grave culture in the Swat valley of Pakistan.

No datable material was found associated with the burials. But a lone TL date (2680 BC) from one such burial sites at Ganai in the Ramganga valley is important.

77. EXCAVATION AT MAHET, DISTRICT BAHRAICH.— The Excavation Branch III, Patna, of the Survey resumed excavation at Mahet (Sravasti) in the vicinity of Surajkund area under the direction of L.C. Singh, assisted by B. Nath, D.K. Singh, P.C. Dass, S.P. Gupta, Y.S. Nayal, Y.D. Sharma in collaboration with the Archaeological Research Institute, University of Kansai, Japan.

The northern part of the Surajkund area was taken up for excavation and, divided into two parts, 'A' and 'B'. Altogether four quadrants in both the areas, were excavated and found presenting almost identical results. The index trench in Area A, dug upto the depth of 3.56 m, yielded total eight layers. Only layers (2) and (3) appeared to be habitational deposit. Two structural phases were exposed in both the areas. Area 'A' revealed remains of three house complexes within an enclosure wall. It is a 22 m long wall having a width of 0.65 m and a height of 0-56 m of which only nine courses have survived. Two community wells and two ring-wells were exposed in the area. These wells were encountered on the southern end and both the ring-wells, which measured internally (0.86 and 0.72 m dia). were of two different structural phases, found sealed by layers (1) and (3) respectively.

A wide range of terracotta objects including animal, human and bird figurines, besides beads, discs, hopscotch, wheel, ball, gamesman of different varieties were collected. Noteworthy among these are: moulded plaques showing *mithuna* figures; small Buddha heads; bust portion of female figurines;

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decorated figures of horse, dog, humped bull, elephant, etc., a few toy birds and *ghata*-shaped beads. The iron objects are represented by razor, spear-head, arrow-head, chisel, nail, knives, blade and iron slag. The copper objects include: coins, both circular and rectangular, antimony rod; bangle; ring, etc. Mention may also be made of a beautiful copper sprinkler with handle. Other finds include beads of semiprecious stones mainly of agate and carnelian, glass bangles of different colours, ivory comb, stone pestle and sandstone quern.

Two distinct groups of ceramic industry were identified one belonging to a late phase of NBP Ware period and the other to the Gupta and late Gupta times. The former was found associated with thin and thick red wares, grey ware and degenerated Black-slipped Ware while the other group comprises red ware with bright slip or wash. Some of the mature NBP sherds were also found mixed with the sherds of very late phase. The Gupta pottery is wheel-made except the big storage pots, vases and basins. Made out of well-levigated clay with medium to fine fabric, these exhibit bright red slip. The types are represented by vases, bowls, dishes, *lota*, storage jars, miniature pots, etc. Mention may be made of beautiful roof tiles and floor tiles with decorative designs. A few decorated sherds with incised and applique rope designs were also noticed besides spouts of red ware, found from the lower strata of this period.

On the basis of ceramics and other excavated finds, the site represented the following three periods:

Period I - late NBP period

Period II - Gupta period

Period III- late Gupta period with a Shrunk settlement

The earliest period, i.e., the late NBP period was devastated by flood as is evident from the deposit of sand and silt. The site remained under occupation during the Gupta period as indicated by the structural remains.

78. EXPLORATION IN DISTRICT BALLIA.— In the course of village-to-village survey of both the banks of the river Chhoti Sarju and Bahera Nala in tehsils Ballia, Bansdih and Rasra, Purushottam Singh and Ashok Kumar Singh of the Department of Ancient Indian History, Culture and Archaeology of the Banaras Hindu University explored the following sites yielding remains of the Chalcolithic, Black-slipped Ware, NBP, grey ware, Sunga-Kushan, Gupta and medieval periods.

<i>Tehsil</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Ballia	Jagdishpur	Red ware, Kushan and Gupta bricks
-do-	Kurmipur	Black-slipped Ware, NBPW, grey ware, red ware
-do-	Sihpur	Black-slipped Ware, grey ware, NBPW, red ware. Kushan and Gupta bricks
-do-	Wina (Waina)	Black-and-red ware, Black-slipped Ware. NBPW. grey ware, red ware, Kushan and Gupta bricks

<i>Tehsil</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Bansdih	Alam-ka-tola	Red ware, bricks of medieval period
-do-	Bhunadih	Cord-impressed red ware, painted and plain black-and-red ware, painted and plain Black-slipped Ware, red-slipped ware and red ware
-do-	Chandayar	Black-slipped Ware, grey ware, red ware, and terracotta beads
-do-	Chhatarsand	Red ware, Kushan and Gupta bricks
-do-	Deorhi	Red ware, Kushan and Gupta bricks
-do-	Halpur	Red ware, Kushan and Gupta bricks
-do-	Isar Pithapatti	Red ware, spouted vessels of medieval period
-do-	Janwan	Red ware, ring-wells, Kushan and Gupta bricks
^lo-	Kansar	Medieval
-do-	Pakka Kot	Red ware, Kushan and Gupta bricks
-do-	Zimi Chak	Black-slipped Ware, grey ware, NBPW, red ware, Kushan and Gupta bricks
Rasra	Hajauli	Red ware, tarracotta pestles and beads, Kushan and Gupta bricks
-do-	Lakhneshwardih	Red ware, spouted vessels of medieval period
^io-	Sanwaradih	Black-and-red ware, Black-slipped Ware, grey ware, NBPW, red ware, Kushan, Gupta and medieval bricks
-do-	Tikka Deori	Black-slipped Ware, grey ware and red ware
-do-	Unai	Black-and-red ware, Black-slipped Ware, NBPW (fine variety), grey ware, red ware and medieval Red ware

79. EXPLORATION IN MANDAKINI VALLEY, DISTRICTS CHAMOLI AND TEHRI GARHWAL.— Rakesh Tewari of the Department of Archaeology and Museums, the Government of Uttar Pradesh, assisted by B.P. Badoni, B.B.S. Rawat, undertook village-to-village explorations in the Mandakini valley.

Out of one hundred and two villages explored, only forty-five yielded important archaeological finds which include groups of temples, sculptures, inscriptions and habitational sites which are tabulated below.

<i>District</i>	<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Chamoli	Rudraprayag	Bawai	A group of medieval temples and images of Kubera, Ganesa, Lakshmi-Narayana
-do-	-do-	Falasi	A group of medieval temples, remains of a temple of <i>bhumija</i> style
-do-	-do-	Karnadher	A group of <i>nagara</i> style temples of medieval period, sculptures of Mahishamardini Durga and standing Vishnu
-do-	-do-	Naari	A group of medieval temples: the main temple with wooden <i>chhatra</i> ; images of two-faced Varahi, Mahishamardini Durga and Ganesa
-do-	-do-	Pola	Standing Vishnu and Ganesa of ninth-tenth century
-do-	-do-	Tilwara	Medieval temple, small <i>nagara</i> style temples, stone image of Narasimha <i>avatara</i> in the <i>garbha-griha</i>
-do-	Ukhimath	Agastyamuni	Remains of medieval temple and images of Ganesa, Uma-Mahesa of medieval period
-do-	-do-	Amrapuri	Remains of a medieval temple
-do-	-do-	Baarkot	Medieval temple remains and an image of Ganesa
-do-	-do-	Bhiri	Remains of medieval temples and an image of Vishnu
-do-	-do-	Bhanaj	A group of medieval temples: three of <i>rekha-sikhara</i> and one of <i>vallabhi</i> style; images of Surya, Uma-Mahesa, Vishnu, Lakshmi-Narayana, <i>Seshasayi</i> - Vishnu
-do-	-do-	Bhatwan	Medieval temple with <i>garbha-griha</i> and <i>mandapa</i> of <i>triratha-nagara</i> style
-do-	-do-	Chandrapuri	Lakshmi-Narayana temple (seventeenth century) with <i>garbha-griha</i> and <i>mandapa</i>
-do-	-do-	Damar	A group of ten temples of <i>nagara</i> style; images of Ganesa, Uma-Mahesa, <i>nandi</i> , etc., of twelfth-thirteenth century

<i>District</i>	<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Chamoli	Ukhimath	Deval	A group of medieval temples; images of Surya, Ganesa, Uma-Mahesa, Mahishamardini Durga, standing Vishnu, Karttikeya, Parvati and Varaha of medieval period
-do-	-do-	Dharsil	Remains of medieval temples, early medieval sculptures of Karttikeya, Vishnu, Uma-Mahesa, etc., inscription of king Anantapala of Garhwal, <i>samvat</i> 1392
-do-	-do-	Fahli	A group of temples belonging to eleventh-twelfth century with <i>garbha-griha</i> and <i>ardha-mandapa</i> of <i>nagara</i> style
-do-		Falhi	Remains of medieval temples; <i>eka-mukha</i> Siva-linga, sculptures of Kubera, etc., of tenth-eleventh century
-do-		Fegu	Medieval temples of <i>phansana</i> and <i>bhumija</i> styles and Kalyanasundara image
-do-		Hat	<i>Eka-mukha</i> Siva-linga; <i>Navagraha</i> panel; images of Ganga, Yamuna, Mahishamardini Durga, Uma-Mahesa, Mahesvari, etc., of eleventh-twelfth century
-do	-do		
--do	--d	Jalai	Remains of medieval temple and image of Lakshmi-Narayana of twelfth-thirteenth century
		Kandara	Group of temples (tenth-eleventh century) of <i>phansana</i> and <i>nagara</i> style; images of Ganesa, Kubera, Mahishamardini Durga, Vishnu, Uma-Mahesa, etc
-do-	-do-	Nagar Sal	Remains of medieval temples and image of Lakshmi-Narayana
-do-	-do-	Naili	Medieval temple remains and image of Seshasayi Vishnu (twelfth-thirteenth century)
-do-	-do-	Parkandi	Early medieval inscribed image of Kubera (?)
-do-	-do-	Silla	Medieval group of temples; images of Kalyanasundara, Uma-Mahesa, Ganesa, Vaishnavi, etc

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<i>District</i>	<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Chamoli	Ukhimath	Semi	Medieval temple remains; images of Surya, Devi and Vishnu
-do-	-do-	Shubhdini	Temple of twelfth-thirteenth century with <i>garbha-griha</i> and <i>antarala</i> of <i>nagara</i> style, image of Seshasayi Vishnu
-do-	-do-	Tyung	Medieval temple of ninth century; images of Mahishamardini Durga, Vaishnavi, Ganesa and Uma-Mahesa
-do-	-do-	Vasu Kedar	Group of medieval temple remains and image of Ganesa, etc
Tehri-Garhwal	Deoprayag	Bhanga	Medieval temple remains; images of Mahishamardini Durga, Ganesa, Uma-Mahesa, Parvati (eleventh-twelfth century)
-do-	-do-	Dangi	Medieval temple with the sculptures of Uma-Mahesa and Ganesa
	-do-	Dankot	Kushan bricks, medieval temple, <i>eka-mukha Siva-linga</i> , image of Ganesa and medieval sculptures
-do-	-do-	Deval	A group of temples with <i>garbha-griha</i> and <i>antarala</i> of <i>nagara</i> style (medieval period); images of Surya, Vishnu, Mahishamardini, Lakshmi-Narayana and Uma-Mahesa
-do-	-do-	Dhangudi	Medieval sculpture of Ganesa
-do-	-do-	Kandali	Medieval temple remains and Siva temple of <i>nagara</i> style and images of Surya, Lakshmi-Narayana, Uma-Mahesa (eleventh-twelfth century)
-do-	-do-	Kiroda	Medieval temple remains; images of <i>Seshasayi</i> Vishnu, standing Vishnu, Uma-Mahesa, Parvati, Mahishamardini-Durga and about a dozen <i>Siva-lingas</i>
-do-	-do-	Kumbri	Remains of medieval temple; images of Ganesa, Mahishamardini-Durga, Hari-Hara and <i>Sapta-matrikra</i>

<i>District</i>	<i>Taluk</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Tehri-Garhwal	Deoprayag	Munna-Deval	Temples of <i>phansana</i> and <i>nagara</i> style; images of Ganesa, Karttikeya, Uma-Mahesa, Parvati, Surya (eleventh to thirteenth century)
-do-	-do-	Pujargaon	Temple of twelfth-thirteenth century with image of Vishnu in the <i>garbha-griha</i>
-do-	-do-	Raidi	Temples of <i>nagara</i> style; images of Ganesa, Karttikeya, <i>Vinadhara-Siva</i> , Mahishamardini-Durga, Kaumari, <i>Trimurti</i> , <i>matrika</i> panel, <i>chaturmukha Siva-linga</i> of ninth-tenth century
-do-	-do-	Sumari	Medieval temple remains, <i>Siva-linga</i> , fragmentary images of tenth-eleventh century
-do-	-do-	Sem	<i>Samadhis</i> of Natha cult with <i>Siva-linga</i>
		Surya Prayag	Medieval temple remains with <i>Siva-linga</i> and images of Ganesa, Uma-Mahesa, Mahishamardini-Durga
		Timli	Medieval temple remains and a four-armed deity (fourteenth-fifteenth century)

80. EXPLORATION IN DISTRICT LAKHIMPUR KHIRI.— K.K. Singh of the Uttar Pradesh State Archaeological Organisation during the course of exploration under the direction of Rakesh Tewari, discovered the following sites of archaeological importance.

<i>Village/Site</i>	<i>Nature of remains</i>
Ambupur mound	Medieval red ware
Andapur Gauria mound	Medieval red ware
Bairagar mound	Medieval red ware
Banskhera mound	Red ware and bricks of medieval period
Barkherwa Bartawa	Stone sculpture of medieval period
(Ikbalpur) Bijhauili	Medieval red ware
Devakali	Stone sculpture of medieval period
	Siva temple; sculptures of medieval period and nineteenth century sculptures and temple tank

<i>Village/Site</i>	<i>Nature of remains</i>
Fardhan	Late medieval sculptures
Gauria	Medieval red ware
Jamunia	Temple of nineteenth century
Jhariya (Katiya) mound	Medieval red ware
Jharlia (Purva)	Tank of nineteenth century
Kaimahra mound	Remains of a <i>garhi</i>
Katia	Medieval red ware and late medieval temple
Khiri	Temple and mound of medieval period; Black-slipped Ware and red ware
Kodri mound	Medieval red ware
Mahammadabad mound	Medieval red ware
Majhadia mound	Medieval red ware and bricks
Mathna	Stone sculpture of late medieval period
Mathna (Shivala Purva)	Siva temple of nineteenth century
Mirpur	Siva temple of nineteenth century
Paharapur	Late medieval temple and sculpture
Parsadha	Medieval red ware
Pirpur	Siva temple of nineteenth century
Rampur Gokul	Medieval red ware
Salempur mound	Medieval red ware
Sarwanpur mound	Medieval red ware
Sauthan	Medieval sculpture
Semrai mound	Medieval red ware
Sisawan Kalan	Medieval red ware
Sisawan Khurd	Medieval red ware
Ujargoon mound	Medieval red ware

81. EXPLORATION IN DISTRICT LALITPUR.— In continuation of village-to-village exploration, Regional Archaeological Unit, Jhansi of the Uttar Pradesh State Archaeological Organisation under the

direction of Rakesh Tewari and Ambika Prasad Singh, explored seventy-four villages in block Mandaura. Of these archaeological remains including stone sculptures and monuments could be traced in only twenty-five villages, details of which are as under.

<i>Village/Site</i>	<i>Nature of remains</i>
Bahadur Pur	Late medieval temple of Siva with Siva-lingas and <i>nandi</i>
Bamarana	Late medieval Jaina temple; images of Parsvanatha, Neminatha and a <i>manastambha</i> , Narasimha image and fragmentary stone sculptures
Bamhon	Ruined medieval temple with <i>garbha-griha</i> and <i>ardha-mandapa</i> ; late medieval Jaina temple with square <i>garbha-griha</i> and images of Mahavira and Chandraprabhanatha
Bamhori Khurd	<i>Siva-linga</i> and Mahishamardini Durga; Jaina images; late medieval temple with images of Rama-Janaki in metal and Siva in stone
Bhikampur	Medieval temple remains and sari-stone
Budwar	Late medieval Hanuman temple with images of Mahishamardini Durga, Siva and Hanumana
Chhitara Pur	Medieval temple with <i>adhishtana</i> and images of Karttikeya, Vishnu, <i>vyala</i> ; late medieval temple with an image of Surya
Chomau	Late medieval temple of Rama-Janaki with images of Rama-Janaki
Dhaba	Late medieval Siva temple with a <i>linga</i> in the <i>garbha-griha</i>
Girar	Late medieval temple of Rama with images of Rama, Janaki and Hanuman; Jaina temple (<i>samvat</i> 1844) with paintings from <i>Ramayana</i> , <i>Mahabharata</i> and Jaina religious scenes; images of Rishabhanatha, Ganesa; late medieval <i>baoli</i> with <i>baradari</i>
Gura Khurd	Late medieval temple with images of Rama, Janaki and Hanuman

<i>Village/Site</i>	<i>Nature of remains</i>
Hansari	Medieval sculptures of Mahishamardini Durga, <i>nandi</i> , <i>Vidyadharas</i> and temple remains
Jaitupura	Late medieval temple of Rama-Janaki with metal images of Rama and Janaki
Karitoran	Late medieval Jaina temples of Shantinatha, Adinatha and Neminatha and medieval sculpture of Uma-Mahesa
Lidhora	Medieval sculptures of six-armed Mahishasuramardini, carved stone slabs, Uma-Mahesa, <i>Siva-linga</i> , Siva and Hanuman
Mandaura	Late medieval fort and Jaina temples; medieval sculptures of Siva, <i>Seshasayi</i> Vishnu, <i>Sapta-matrika</i> and <i>Navagraha</i> panels
Neem Khera	Late medieval sculptures of Siva and Hanuman
Pahari Kalan	Image of Ganesa, medieval
Pisnari	Medieval sculptures and ,sati-stone
Rangaon	Medieval sculptures of Ganesa and a carved stone depicting a horse-rider and a <i>mithuna</i>
Semarkhera	Late medieval temple with images of Mahishamardini Durga and Hanuman
Siron	Medieval and late medieval temples with sculptures and <i>Siva-linga</i> images of <i>Nritya-Ganesa</i> , <i>Sapta-matrika</i> panel, twenty-four Tirthankaras, Uma-Mahesa, <i>Siva-linga</i> , <i>Seshasayi</i> Vishnu, standing Siva, Ganesa, Parsvanatha, Rishabhanatha, Parvati and Bhairava
Solda	A late medieval Jaina temple
Sourai	Medieval temple; late medieval <i>baoli</i>
Tori	Mahishamardini Durga and <i>Siva-linga</i> of medieval and late medieval periods

82. EXPLORATION IN DISTRICT LUCKNOW.— Rakesh Kumar Srivastava and Raj Kumar of the State Archaeological Organisation, Government of Uttar Pradesh under the direction of Rakesh Tewari, during the course of village-to-village exploration, discovered the following sites of archaeological importance.

<i>Village/Site</i>	<i>Nature of remains</i>
Alsha Udel Kikuti	Medieval
Amaniganj	Early medieval Varaha image and Siva temple of medieval period
Ant	Red ware, Kushan terracottas Late
Baghauri	medieval temple remains <i>Baradari</i> ,
Bara Khambha	mosque, late medieval period Red ware of
Bhargarh Tila (Barauli)	medieval period and bricks
Birpur	Red ware of medieval period, remains of brick temples, including carved bricks, doorjambs and stone sculptures
Dal Khera	Sculpture
Daulatpur	Late medieval stone sculpture
Dhede mau	Medieval red ware
Fattepur	Remains of early medieval brick temple and large stone images
Garhi Sanj Khan	Temple of eighteenth century
Gaunda	Stone image of Vishnu, tenth century
Gusain-ka-tila	Black-slipped Ware, black ware, red ware and grey ware
Isram	Medieval red ware and Black-slipped Ware
Jinni Shah-kas-than	Tank of nineteenth century
Kharauha	Temple and sculptures of late medieval period
Koneswara	Siva temple, eighteenth century
Malihabad (Kasmendi Khurd)	Late medieval fort and stone images
Mall (Lotani Devi)	Remains of early medieval temples
Moharikalan	Medieval sculpture
Pahernagar Tikaris Gosainganj	Black-slipped Ware and red ware

EXPLORATIONS AND EXCAVATIONS

<i>Village/Site</i>	<i>Nature of remains</i>
Rahamatnagar	Late medieval remains
Rahta (Jalpa-devi Mandir)	Remains of medieval brick temples and stone image of Surya
Sadna mound	Black-slipped Ware and red ware
Saral Gudauli	Late medieval temples
Saspan	Remains of medieval temple and broken stone sculpture
Sekhana Ghat	Late medieval temple
Shitala-devi	Temple of eighteenth century
Shivalar	Late medieval sculpture
Trigawan (Tirgawan)	Remains of medieval brick temples; door jambs, Siva- <i>linga</i> and carved bricks

83. EXPLORATION IN DISTRICT PITHORAGARH.— Rakesh Tewari, Hemraj and Suresh Kumar Dubey of Regional Archaeological Unit, Almora, of Uttar Pradesh State Archaeological Organisation resumed exploration in tehsil Pithoragarh and brought to light archaeological remains including stone sculptures, copper plates and monuments from the following sites.

<i>Village/Site</i>	<i>Nature of remains</i>
Anu	Stone sculpture of Mahishamardini of medieval period
Bhagavati-mandir, Balakot	Two stone sculptures of Vishnu and <i>Gajantaka-Siva</i> (ninth and sixteenth century)
Bhagavati-mandir, Kumaaur	Stone <i>matrika-panel</i> , early medieval period
Bhagavati-mandir, Maithana	Stone sculptures of Uma-Mahesa, Mahishamardini and Surya (eighth-fourteenth century)
Bhumiathan, Nakina	Nineteen stone sculptures of Vishnu, Uma-Mahesa, Mahishamardini and Surya (ninth-fourteenth century)
Cave temple, Chunsera	Three stone temples of <i>pidha</i> style of early medieval period; seven stone sculptures of Siva- <i>linga</i> , Surya, Vishnu, Mahishamardini, <i>Seshasayi</i> Vishnu, Ganga and Ganesa (ninth-sixteenth century)
Chainsar	Stone sculpture of Vishnu and fragmentary medieval sculptures

<i>Village/Site</i>	<i>Nature of remains</i>
Chaumu-mandir, Chaupakhiya	Stone sculptures of Vishnu, Surya and Mahishamardini (tenth-twelfth century)
Chaumu-mandir, Vinpata	Stone sculptures of Mahishamardini and Vishnu of early medieval period
Devadar	Stone sculptures of Ganesa, Vishnu, Mahishamardini of early medieval period and medieval pottery
Dhuleshvar-Mahadev-mandir, Dyari	Ten stone sculptures of Mahishamardini, Vishnu, Parvati, Ganga, Varaha, Lakshmi-Narayana, Uma-Mahesa and Surya (ninth-thirteenth century)
Devi-mandir, Jakhani	Three stone sculptures of Vishnu, early medieval period
Devi-mandir, Putan	Stone sculptures of Surya and Parvati of early medieval period
Dekatya	Five stone sculptures of Vishnu and Mahishamardini (medieval period)
Dhari	Early medieval stone sculptures
Ghantakarna	Three stone sculptures of Mahishamardini, Ganesa and Vishnu (tenth century)
Goril-devata-mandir, Kumaur	Stone sculptures of <i>Seshasayi</i> and standing Vishnu, medieval period
Gokarnesvar-Mahadev-mandir, Chhana	Stone sculptures of <i>Seshasayi</i> Vishnu and Ganesa of early medieval period
Ghatkeshvar-mandir, Chhana	Stone sculptures of Mahesvari, Kaumari, Indrani, Chamunda, Brahmani, <i>Veenadhara</i> Siva, Ganesa and Mahishamardini of early medieval period; late medieval stone <i>veera-khambha</i>
Gurna	Stone sculpture of Lakshmi-Narayana of late medieval period
Hathkatiya-devi-mandir, Kumaur	Stone sculpture of Surya, early medieval period
Jagdamba-mandir, Jakhpant	Seven stone sculptures of Mahishamardini, Vishnu, Surya and Ganesa (ninth-twelfth century) and temple of medieval period
Jakh	Medieval stone sculpture of Surya and remains of stone temple
Kaushalva-devi Rock temple	Six stone sculptures of Vishnu, Uma-Mahesa and Ganesa (sixth-tenth century)

<i>Village/Site</i>	<i>Nature of remains</i>
Kedaresvar-mandir, Tapsura	Three stone sculptures of Vishnu and Karttikeya (eighth-sixteenth century), one bronze bell of late medieval period
Khandenath-mandir, Sirkuch	Stone sculpture of Mahishamardini of early medieval period
Lelu	Eighteen cup-marks on rock and potsherds of medieval period
Majhirkanda	Stone sculpture of Parvati, early medieval period
Manasdevi-mandir, Gaithna	Eleven stone sculptures of Parvati, Surya, Ganesa, etc., (eighth-fourteenth century)
Mar	Stone sculptures of Vishnu, Mahishamardini, Ganesa, Parvati and <i>Navagraha</i> panel of early medieval period
Masu	Stone sculptures of early medieval period
Nainavati-mandir, Naini	Two stone sculptures of Mahishamardini and Surya of early medieval period; three stone <i>veera-khambhas</i> of medieval period
Naula, Hatgaon	Stone-built <i>naula</i> (spring water-tank) belonging to thirteenth century
Near Bus stand, Pithoragarh	Stone sculpture of Ganesa, early medieval period
Parkot	<i>Jaladhara</i> (water source), fourteenth century; remains of medieval temple
Ravalgaon	Stone sculpture of <i>Seshasayi</i> Vishnu of early medieval period
Redar Puneri	Stone sculptures of Uma-Mahesa and Ganesa of early medieval period
Salla	Stone sculptures of Mahishamardini and Vishnu of early medieval period
Sileni	Inscribed stone sculpture of Lakshmi-Narayana (Saka 1324, AD 1402)
Siva-mandir, Badalu	Stone sculptures of Mahishamardini and Vishnu of early medieval period
Siva-mandir, Badari	Stone sculptures of Vishnu and <i>Seshasayi</i> Vishnu of medieval period

<i>Village/Site</i>	<i>Nature of remains</i>
Siva-mandir, Bajathi	Stone sculpture of early medieval period, stone <i>veera-khambhas</i> of medieval period
Siva-mandir, Billai	Five stone sculptures of Lakshmi-Narayana, Ganesa, <i>eka-mukha Siva-linga</i> , Mahishamardini, Vishnu and four-faced Siva-/linga (eleventh-seventeenth century)
Siva-mandir, Devlal	Two stone sculptures of Mahishamardini, early medieval period
Siva-mandir, Dyot	Five stone sculptures of Parvati, Ganesa and Vishnu, tenth-twelfth century
Siva-mandir, Pithoragarh	Stone sculpture of Siva-Parvati, thirteenth century
Siva-mandir, Takana	Seven stone sculptures of dancing Ganesa, Uma-Mahesa, Brahmani, <i>matrika</i> panel, <i>Siva-linga</i> , ninth-twelfth century
Sun-mandir, Lunthura	Four stone sculptures of Vishnu, Ganesa, Mahishamardini and Surya, medieval period
Siva-mandir, Vaste	Stone sculptures of Ganesa, Karttikeya and Vishnu, tenth-twelfth century
Sivalaya, Vishad	Six stone sculptures of Surya, Vishnu, Uma-Mahesa, Lakshmi-Narayana, Ganesa and <i>eka-mukha Siva-linga</i> , eighth-sixteenth century
Temple, Hureti	Stone sculpture of Vishnu, early medieval period
Temple, Pabdo	Stone sculpture of Uma-Mahesa, early medieval period
Urg	Two stone sculptures of Vishnu, early medieval period; brass Sun-watch (Saka 1667, AD 1745)
Vinr	Stone sculpture of Mahishamardini; fragments of sculptures and temple, eleventh-thirteenth century

84. EXPLORATION IN DISTRICT SULTANPUR.—Indu Prakash of the Lucknow Circle of the Survey brought to light the following antiquarian remains in District Sultanpur under the village-to-village survey scheme.

<i>Village/Site</i>	<i>Tehsil</i>	<i>Nature of remains</i>
Amligaon	Musafir Khana	Red ware sherds of medieval period
Asharafpur	-do-	Remains of a nineteenth century mosque

EXPLORATIONS AND EXCAVATIONS

<i>Village/Site</i>	<i>Tehsil</i>	<i>Nature of remains</i>
Daulatpur Lunhar	Musafir Khana	Red ware of medieval period
Dharauli	-do-	Red ware of Sunga-Kushan period
Dubaria	-do-	A group of temples of nineteenth century containing a few stone sculptures of medieval period
Ganjanpur	-do-	Antiquarian remains ranging from sixth century BC to medieval period including NBPW, Black-slipped Ware, associated red ware and late medieval pottery
Ghunnaur	-do-	Red ware of medieval period
	-do-	
Kachnaon		Early historical pottery ranging from NBPW to Kushan periods
Kochhit	-do-	Early historical pottery including NBPW, Black-slipped and associated red wares and a few stone sculptures of medieval period
Manshapur	-do-	Red wares ranging from Kushan to the medieval period
Mubarakpur	-do-	A domed structure called <i>matha</i> of Gosains. nineteenth century
Nara Adhanpur	-do-	Red ware of medieval period
Palia Chandapur	-do-	Architectural and sculptural fragments of stone, early medieval period
Pichhooti	-do-	Medieval potsherds
Pindara Karnai	-do-	Medieval stone sculptures (kept in a modern temple dedicated to Siva)
Pindara Thakur	-do-	Ruins of a brick <i>haveli</i> , nineteenth century
Rudauli	-do-	A few sculptural fragments of stone, medieval period
Sarai Talukedar	-do-	Remains of a <i>sarai</i> built in nineteenth century
Thauri	-do-	Pottery ranging from Sunga-Kushan to the medieval period

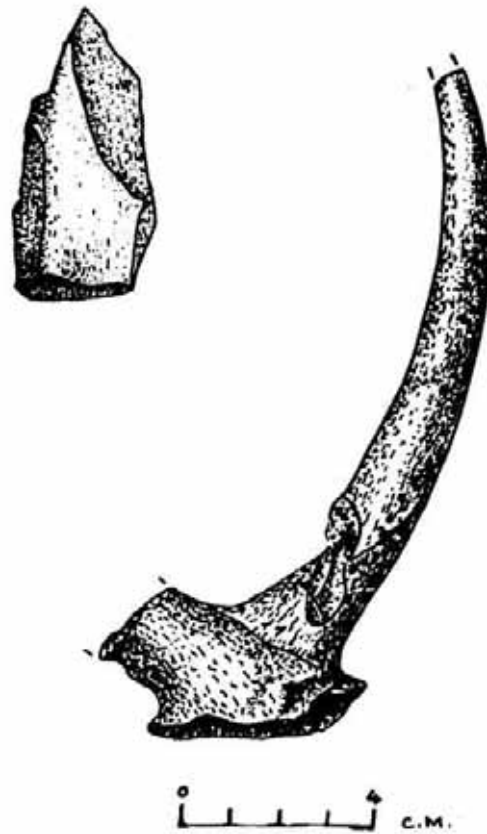


FIG. 29. *Dihar : bone point*

WEST BENGAL

85. EXCAVATION AT DIHAR, DISTRICT BANKURA.— The Department of Archaeology, Calcutta University, under the direction of A.C. Pal, assisted by C. Gupta, M. Mitra, R. Chaudhuri, A.K. Datta, N.C. Das, S. Kundu and K. Adhikari, resumed excavation at Dihar ($23^{\circ}7' 10''$; $87^{\circ}21'$) to confirm the cultural sequence of previous year's excavation and the nature of structures, besides imparting field training to the students. At a strategic location on the western side of the Kana Nadi—a tributary of Darakesvar the, five trenches (E-II, F-II, 1-16, 1-17 and L-20) were laid horizontally. The mound (99668 sq m) which rises about 7.5 m from the river bed of the Darakesvar revealed the occupational strata of 2.5 m thick, representing two broad distinct cultures viz., the Chalcolithic (Period I), and the Historical (Period II). In view of the inclusive nature of the occupational strata, there is neither a hiatus nor a traditional phase that intervened between the two periods. The total cultural deposit consists of seven distinct layers, of which layers (1) to (4) belong to (Period II). During the period under review, all five trenches were exposed down to the Chalcolithic level which was found at an average depth of 2.5 m below the surface level. Deep digging was restricted only to a limited area in FII and L 20 where the natural soil was reached at a depth of 4.5 m below the surface level.

The Chalcolithic (Period I) represents 68 cm thick deposit on an average and includes structural remains, assemblage of ceramics, lithic and bone tools, fragments of copper and other objects. The ceramic industry is mainly represented by black-and-red ware, cream-slipped ware, incised ware, besides a limited number of grey and Black-slipped Wares. The shapes in black-and-red ware include, vase, bowl, saucer, trough, etc., marked by paintings in white generally on the black inner surface. The painted decoration consists of oblique strokes, dots, dashes and parallel horizontal lines. The sherds of this variety generally have grey core due to unoxidized condition. The outer surface of this ware reflects various shades of black-and-red colour. The red colour ranges from a light brown orange to glossy red lustre. The typical black-and-red ware consists of carinated bowls with splayed-out flaring rim and convex-sided bowl with a saggar base. Apart from this, the dominant varieties are channel-spouted vessel and slightly everted rimmed bowl (pl. XXVIII B).

Among other noteworthy finds of this period, mention may be made of bone tools, such as, points (fig. 29), picks, chisels with broad and narrow end, scrapers, needles and drills (pl. XXVIII A), found scattered over the floor level. Besides, microlithic blades, scrapers, thumb-nail scrapers and a few micro-cores of fluted variety along with a few fragmentary copper objects, elongated beads, pendants, etc.

The rammed-earth, post-holes and fragments of wattle-and-daub point to their dwelling habits. The houses were of simple type and occurrence of round structure was traced for the first time at this site.

Period II (Historical), witnessed the introduction of iron and cast copper coins with tree-in-railing, *nandipada* and elephant symbols along with terracotta game objects, animal figurine (pl. XXVIII C), etc.

86. EXPLORATION IN DISTRICT BANKURA.— T.J. Chakraborty of the Calcutta Circle of the Survey, during the course of village-to-village survey, discovered the following sites of archaeological importance.

<i>Police Station</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Onda	Baharmuni	Late medieval brick temple of Siva and a brick-built <i>rasa-mancha</i>
-do--	Chandrakona	Late medieval brick-built Siva temple
do--	Damodarbati	Late medieval temple Brick-built
do--	Khamarbere	temples and <i>rasa-mancha</i> Brick-built
do--	Krishnanagar	temples and <i>rasa-mancha</i>
do-	Lapur	Late medieval brick-built temples and <i>rasa-mancha</i>
-do-	Medinipur	Late medieval temples

87. EXPLORATION IN DISTRICT MIDNAPUR.— Santanu Maiti of the Calcutta Circle of the Survey, during the course of village-to-village survey, discovered the following ancient temples and sites having archaeological importance.

<i>Police Station</i>	<i>Village/Site</i>	<i>Nature of remains</i>
Bhagwanpur	Barurbheri	Late medieval brick temple
-do-	Gurgram	Late medieval temple
Bhupatinagar	Giagodi (Nandichak)	Late medieval <i>charchala</i> temple
-do-	Jhinukkhali	Late medieval brick temple
-do-	Keshaidighi	Late medieval temple and Jaina idol
-do-	Suadighi	Late medieval temple
-do~	Uttarbaroj	Late medieval mound

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS'

ANDHRA PRADESH

1. CHOLA INSCRIPTION, KUKATLAPALLI VILLAGE, VINUKONDA MANDAL, DISTRICT GUNTUR.— This inscription belonging to Rajendra Chola of the Velanatichoda dynasty, records that certain Malloju, son of Mayambhika of Kakatlapalli village made the gift of sixty-six sheeps and land to god Madhukesvara for a perpetual lamp, *vruttis* and Chalivendra for the merit of the king. This has to be maintained by Malloj and his son Jiyya.

2. SANSKRIT INSCRIPTION, PHIRANGIPURAM VILLAGE. TALUK AND DISTRICT GUNTUR.— This inscription of the Reddy king Vema Reddy is in the Telugu-Kannada script and the Sanskrit language. It records the construction of a tank named Saptasanthana-sagar. It is a lengthy *prasasti* containing all the titles of the king.

3. EASTERN GANGA CHARTERS, HYDERABAD, DISTRICT HYDERABAD.— Three sets of copper-plate charters, written in the Sanskrit language and the Telugu-Kannada characters of the twelfth century AD. are preserved in the Office of the Director of Archaeology and Museums. Government of Andhra Pradesh, Hyderabad. These charters belong to the reign of Eastern Ganga king Anantavarma-Chodaganga.

Of these, the first set is dated Saka 1037 (AD 1115) and registers the royal grant of a tax-free village named Bantipalli in Pedda-Kottama-vishaya to one Revana, son of Ketama-nayaka and Prolama, for the merit of his parents and his own self. The charter was composed by *Bhatta* Nachana-Sarma.

The second set, dated Saka 1039 (AD 1117), registers the royal grant of a village named Kundigrama in Panchali-*vishaya* to a Brahmana (name not clear) of Sisila-*gotra* by the king for the merit of his parents and his own self.

The third set is undated and registers the royal grant of a village Kolaram to Vemkana, son of Komma-nayaka and Eriyapa(ma) belonging to the Ayya family for the merit of his parents and his own self.

4. KALYANA CHALUKYA INSCRIPTION, RAMAJIPALLI, DISTRICT MAHABOBNAGAR.— This Kannada inscription, engraved on a pillar set up in front of the Anjaneyasvami temple in the village, belongs to

¹Information from: 3-5, 7-8, 11-13, 17-20, 23-28 and 30, M.N. Katti. assisted by M.D. Sampath. M Jayarama Sharma. T.S. Ravishankar, N. Nanjundaswamy, C.A. Padmanabha Sastri, D.M. Nagaraju, S. Nagarjuna. S Swaminathan. Jai Prakash, K. Karuppaiah, S. Rajavelu of the Epigraphy Branch of the Survey, Mysore; 12, 6. 9-10. Department of Archaeology and Museums. Government of Andhra Pradesh; 14-16, Department of Archaeology and Museums, Government of Karnataka; and 21-22 and 29, Department of Archaeology, Government of Tamil Nadu.

°the Kalyana Chalukya king, Trailokyamalladeva. Being dated Saka 971 (AD 1049), it describes the eulogy of his chief Sankaragandarasa, who while camping at Kondur, made a grant of twelve *mattars* of land for the worship and food offerings to the deity Mahesvaradeva of Kondur for the purpose of giving alms and feeding the ascetics and Brahmanas on the occasion of *kanya-samkranti*.

5. INSCRIPTION OF KANDURI CHODA CHIEF, UPPARAPALLI, DISTRICT MAHABOONNAGAR.—This Telugu inscription in the characters of the twelfth century AD is engraved on a stone lying in the field of Sudhakar Reddy. Dated in the cyclic year Hemalambi, it refers to the Kanduri-Choda chief, Nalla Bhimadeva-Choda, who is described as *mahamandalesvara*, *Kodurpuravaresvara* and as one who belongs to *Surya-vamsa*, *Kasyapa-gotra* and *Karikala-anvaya*. It registers the grant of lands by his queen Venna-mahadevi for the worship and food offerings to the deity Nrisimhadeva of Mavindlapalli. On the occasion of *uttarayana-samkranti*, for the merit of the chief.

6. KANNADA INSCRIPTION, CHILLARAGI, BANSWADA TALUK, DISTRICT NIZAMABAD.—The inscription is in the Telugu-Kannada script and the Kannada language. It belongs to the Chalukya subordinate Somabhattarakka and is dated in 'S. 980 *Vilambi samvatsara*. It registers the gift of eighteen *mattars* of land to god Hastaradevara.

7. BRAHMI INSCRIPTION, BHIMUNIPATNAM, DISTRICT VISHAKHAPATNAM.—This inscription in Prakrit language and the Brahmi characters of about the second-third century AD is engraved on a rock locally called Pavurala-bodu. It mentions Pauvanakiri and records the gift of a *chhata* and *madapa* (*mandapa*) to a *mahavihara*.

8. CHALUKYA INSCRIPTION, VISHAKHAPATNAM, DISTRICT VISHAKHAPATNAM.— This Telugu inscription, originally discovered in the village Kokkiragapalli in the Yelamanchi taluk of the same district is now preserved in the Corporation Museum there. It belongs to king *Sarvvalokasraya* Vishnuvardhanamaharaju and is dated to Saka 1101 (AD 1179). It states that the son of a Goriyaboya undertook to supply *ghee* for a perpetual lamp, donated to a temple (name not known) by the wife of Suraparaju on the occasion of *vishu-samkranti*.

9. INSCRIPTION, PANCHADARLA VILLAGE, TALUK YELAMANCHILI, DISTRICT VISHAKHAPATNAM.— The inscription, dated in Saka 1416 (AD 1494) and *Ananda-nama samvatsara*, mentions the genealogy of Kumara Yerra Bhupati and Vishnu-varadhana of the later Eastern Chalukya dynasty. It also registers the gift of some land to god Bhairava.

10. TELUGU INSCRIPTION, CHODAVARAM VILLAGE, TALUK ANAKAPALLI, DISTRICT VISHAKHAPATNAM.— This inscription, belonging to the Matsya chief of Vaddadi, is in the Telugu script and language, mentions that in the year kalayukti, Sri Bhupatiraya Veerapratapa Vallabha Raju installed god Kesava for the merit of himself and his descendants.

KARNATAKA

11. HOYSALA INSCRIPTION, NITTUR, DISTRICT MANDYA.— This Kannada inscription, engraved on a slab set up near the Vishnu temple, belongs to the reign of Hoysala king, Vira-Narasimha. Dated Saka 1206, *Sva (Su) bhanu* (AD 1248), it records the erection of the temple of Alagaperumaludeva at

Maligehala (i.e., the present Malligahalli or Malagalalli) and Gopinathadeva at Nittur and the grant of lands for worship, offerings and *khanda-sphutitajirnnoddhara* of the deities mentioned above.

12. KALYANA-CHALUKYA INSCRIPTION, GABBUR, DISTRICT RAICHUR.— This Kannada inscription, engraved on a stone lying by the side of the way leading to Suguresvara temple, belongs to the reign of Chalukya king, Tribhuvanamalla (Vikramaditya VI). It is dated in the Chalukya Vikrama year 9, Raktakshi (AD 1084) and states that, while *mahamandalesvara* Joyimarasa was governing the divisions Ededore 2000 and Kallakelage 500 at the request of *maneverggadedandanayaka* Kallapayya, the former granted lands in the village Badahalli in Mudugundur 70 division, as *sarvanamasya* for the worship, *khanda-sphutita* and *nava-karma* services to the deity Kalidevasvami of Piriya-Gobbur on the occasion of the lunar-eclipse. It also registers the gift of income from taxes (*tere*) by Joyimarasa and Andaladeva for the worship to the same deity.

13. Two KANNADA INSCRIPTIONS, KOPPAI A. DISTRICT RAICHUR.— The first of the two Kannada inscriptions, engraved on a stone lying near a fort, is dated in Saka year 909, Sarvajit (AD 987) and records the death of Rambaladevi, the wife of Chikkaladeva, who was like goddess Sarasvati, well-versed in *Sruti*. She is referred to as the daughter of Basabhupa, the son of Chaladanka-Ganga and Kavanabbe.

The second inscription is in the characters of c. tenth century AD. It furnishes the genealogy of the teachers of Jaina preceptor Abhayanandi pandita. His preceptor is described as the one well-versed in grammar (*vyakarana*). logic (*tarkka*) and canons of religion (*siddhanta*).

14. KANNADA INSCRIPTION, KABBARGI, DISTRICT UTTARA KANNADA.—This stone inscription, located OP, the left side of the Vishnu temple, records the grant of Kabbargi village to the god Mabaladeva. It is written in the Kannada characters of the thirteenth century.

15. HERO-STONE INSCRIPTION, SHIRAGUNJI FOREST, DISTRICT UTTARA KANNADA.— A hero-stone inscription, near the Isvara temple, in the Kannada character of the eleventh-twelfth century, records the donation of lands.

16. STONE INSCRIPTION, TALAGOD, DISTRICT UTTARA KANNADA.—This Kannada inscription, in the premises of the Vishnu temple, records the donation of lands. It is assignable to the fifteenth century.

MADHYA PRADESH

17. SANSKRIT INSCRIPTION, RAKTERA, DISTRICT GUNA.— This inscription, engraved on a rock, is in a corrupt Sanskrit language and the Nagari characters. It is dated in Vikrama 1555 (AD 1498) and refers to the rule of *Suritrana* Gyasuddin of Malava country. The record states that the foot-print (*paduka*) of Visalaraja was caused to be made by Mutiraja. The fort of Chanderi is referred to in the record.

18. PEDESTAL INSCRIPTION. RAKTERA, DISTRICT GUNA.—This inscription, engraved on the pedestal of a seated image, is in a local dialect and the Nagari characters. It is dated to the Vikrama 1675 (AD 1618) and records the making of the image of Vagnatha by *Pant* Vihari. the *karigara* belonging to the family of the *luharas* and hailing from Piparodha.

19. PILLAR INSCRIPTION, CHANDERI, DISTRICT GUNA.—This inscription, engraved on a pillar of the *vedi*, is in a corrupt Sanskrit language and the Nagari characters of the embossed type. Dated Vikrama

1857 and Saka 1722 (AD 1800), it records the construction of a *vedi* (altar) by Lala Paramasusha in the presence of Vedaka in the middle of Chandrakapuri (i.e., Chanderi). The donor is stated to be the son of Sahabhaputasigha and brother of Sahadamasahi. All these members are stated to belong to Mula-samgha, Sarasvati-gachcha, Valatkara-gana and Kundakunda devamani.

TAMIL NADU

20. PANDYA INSCRIPTION, KOVILPATTI, DISTRICT ANNA-DINDIGUL.— This Tamil inscription, engraved on the wall of Periya-pallivasal, belongs to the Pandya king, *Tribho* Sri-Vallabhadeva. The record may be assigned on palaeographical grounds to c. twelfth century AD. It refers to the installation of the deity Palliyarainachchiar in the temple of Duvarapatisvaram-udaiyar, probably by the merchant community *vaniggrama* (*ttar**) of Kodumbalur.

21. TAMIL INSCRIPTIONS, KUDANAGARAM, DISTRICT NORTH ARCOT.— The Department of Archaeology, Government of Tamil Nadu, discovered three inscriptions from the village Kudanagaram in Gudiyattam taluk, written in the Tamil characters. Of them, two are hero-stone inscriptions.

One of the inscriptions found near the Valliyammal Vayal, written in the fourteenth regnal year of Parantaka I (AD 921) states that the hero-stone was installed as a memorial of Nigubayan Anukkan who lost his life while rescuing the catties from the enemies.

The other one found near the Desarathan Kollai (field), is stated to have been installed to commemorate a hero Mudhidan who lost his life in the battle while rescuing the catties.

The third inscription found near the Thikkammal temple, belonging to the period of Bana king, Visaiyatharaiyan, records the donation made by the two chiefs *viz.*, Gangarasan and Sivamaraiyan of lands at Pattikuli for the maintenance of an *eri* (tank) of the village at the instance of the king. This inscription is dated in Saka era 825 corresponding to AD 903.

22. TAMIL INSCRIPTIONS, VENKATTUR, DISTRICT NORTH ARCOT AMBEDKAR.—The Department of Archaeology, Government of Tamil Nadu, discovered four inscriptions written in the Tamil script and language from the village Venkattur in Gudiyattam taluk.

The hero-stone inscriptions bear the sculptural representations of the heroes holding bows and arrows with bodies pricked with the arrows. The catties are shown near the heroes. A lamp and a pot placed on the three-legged stool were shown below the right legs of the heroes.

The sculptural representations of the other hero-stones are partly preserved upto the hip portion. The heroes are found dressed in the similar style as that of their masters.

The two hero-stones, installed in memory of the father and the son who lost their lives in a battle, referred to as Sattaiyan, son of Vikramaditya Thimma Chetty and Sattaiyan Thiruvoral respectively.

These hero-stone inscriptions belong to the third regnal year of the Chola king, Virapandiyan Thalaikonda Kopparakesari-varman who is identified as Aditya Kavikala, the elder son of Sundara Chola. The date of the inscription is AD 963.

EPIGRAPHY

23. BURIAL INSCRIPTION, VEDALAI, DISTRICT RAMANATHAPURAM.—This Tamil inscription, engraved on a slab set up in the burial ground called Kuraippalli, is dated Kollam 863, Prabhava (AD 1688) and refers to the erection of a memorial (*sannadi*) over the mortal remains of Seku-Ivuraki-Maraikkayar, Periyatambi-Maraikkayar, Mamuni-Maraikkayar and Mala-Maraikkayar, accountant of Chellakutti-Maraikkayar on a Friday night. The record further refers to the burning, demolishing and reconstruction of the temples at Elukaraiturai by Nasurakkan in the *maniya* for the *desadipati* of Tiruvadi-simai. It is stated that Seku-Ivuraki-Maraikkayar, son of Periyatambi-Maraikkayar, will get the blessings of Allagudalla for the above-mentioned act.

24. SAMBUVARAYA INSCRIPTION, ASUR, DISTRICT RAMASAMY PADAYACHIYAR.—This Tamil inscription, in the characters of c. fourteenth century AD, is engraved on the south wall of the *garbha-griha* in the Tiruvalisvaram-udaiyar temple. It belongs to the reign of Sambuvaraya chief Mallinathan Sambuvarayan. It states that orders were issued to the *tanattar* of the temple of Tiru-Alandurai-udaiyanayanar at Asur in Kaliyaperunallur-parru to conduct the worship and services to the deity from out of the income from various taxes collected from the tenants (*kasayakkudi*) who had settled down in and around the temple from the nineteenth year of his reign. These taxes are said to have been collected from the tenants till the eighteenth year of his reign.

25. CHOLA INSCRIPTION, KADAMBUR, DISTRICT RAMASAMY PADAYACHIYAR.— This Tamil inscription, engraved on the surface of a rock, is dated in the fourth year of the Chola king Parakesari. The record may be assigned on palaeographical grounds to about the eleventh century AD. It records an agreement entered into by the *urom* of Kadambur with an individual Nallulan Araiyan Madevan for the gold received from the latter. The *urar* undertook to see that the capital amount (*pundu*) is maintained annually.

26. CHOLA INSCRIPTION, PERUMUKKAL, DISTRICT RAMASAMY PADAYACHIYAR.— This Tamil inscription, engraved on a slab set up in the Anjaneya temple, belongs to the reign of the Chola king Uttamachola. Dated in the sixteenth year of his reign (AD 984-85), it records the construction of this stone temple by Ambalavan Gandaradittan.

27. TAMIL INSCRIPTION, PERUMAKKAL, DISTRICT RAMASAMY PADAYACHIYAR.—This Tamil inscription, in the characters of the tenth century AD, is engraved on the north wall of the Mukyacfolesvara temple. It refers to the setting up of an image of Brahma by Nambi Naduvariyum-perumal Oyma-nadu.

28. Two CHOLA INSCRIPTIONS, TINDIVANAM, DISTRICT RAMASAMY PADAYACHIYAR.— Two Tamil inscriptions, engraved on two slabs of a sluice originally discovered at Tiruvampattu village in Gingee taluk of the same District, are now preserved in the PWD Office at Tindivanam. Of the two records, the first belongs to the Chola king Rajaraja I. Dated in the twenty-second year (AD 1007) of his reign, it records the construction of a sluice by Valivalankilan Velan Surri. The second record belongs to the reign of the Chola king Rajendra and is dated to the thirty-first year (AD 1043) of his reign. It records the construction of a sluice by Amanarrurudaiyan Tangi Aruran Sembiyan Uttaramantri.

29. CHOLA INSCRIPTION, DHUVAGUDI, DISTRICT TIRUCHCHIRAPPALLI.—A sluice of the eleventh century AD was found in a big lake at Dhuvagudi near Tiruchchirappalli. An inscription of Kulottunga Chola

I, noticed at this village, records that the said sluice was constructed by an individual called Ulaga Vitanka Peraraiyan. In return, the natives of the village donated lands to the above-mentioned person for his meritorious act. This village is referred to in this inscription as Thuligudi' situated in Meesa-ngiti nadu, a sub-division of Pandya Kulasani Valanadu.

30. HERO-STONE INSCRIPTION, IDAIMALAIPATTIPUDUR, DISTRICT TIRUCHCHIRAPPALLI.— This Tamil inscription in the characters of about the eleventh century AD is engraved on a slab set up near the Ayyanar temple and refers to Valkaikanrappiludaiyan Vettan Madirai of Panaiyur and to the refuge (*adaikkalam*) given to Kalamukkiyar by Muvanai-nattar.

ARABIC AND PERSIAN INSCRIPTIONS¹

ANDHRA PRADESH

1. MISCELLANEOUS INSCRIPTION, ADONI, DISTRICT ANANTAPUR.— This slightly damaged epigraph copied from a mosque called Masjid-i-Dhul Shah, in metrical Persian text in Nastaliq characters, records the construction of Masjid-i-Dhul Shah by one Haidar in AH 1264 (AD 1847-48).

2. MISCELLANEOUS INSCRIPTIONS, VELIDANDA, DISTRICT MAHABOBNAGAR.— Rubbings of three Arabic inscriptions, bearing religious texts and executed in beautiful Thulth characters, were received from the Deputy Superintending Epigraphist, Zonal Office, Madras of the Survey. Of them, one inscription records the date AH 1060 (AD 1650), evidently that of completion of the mosque on which it appears along with the name of the scribe Muhammad Salih Mazandrani who had been a famous calligrapher under Abdullah Qutb Shah (AD 1626-72) of Golconda. These records provide pleasant calligraphical specimens.

GUJARAT

3. MISCELLANEOUS INSCRIPTIONS, BHILOT, DISTRICT BANASKANTHA.— Several modern epitaphs in Persian in beautiful Nastaliq script (inlaid) were photographed from the courtyard of a mosque called Masjid-i-Mahdiyan. These epitaphs on graves in the said mosque provide names, dates of death and lineage of some of the leading Mahdavi personages viz., Bandagi Miran Sayyid Mahmud Thani Mahdi, popularly known as Bihari Pir Sahib (AH 920/AD 1514); Ummul Muminin Bibi Malkan, daughter of Bandagi Miyan Lad Shah Siddiq (and) wife of Hadrat Mahdi (AH 960/AD 1553); Bandagi Miyan Sayyid Abdul Hayy Raushan Munawwar, son of Hadrat Thani Mahdi (AH 980/AD 1572); Miyan Sayyid Ahmad Ghazi, son of Miyan Shah Muhammad (AH 1106/AD 1695); Bibi Kad Banu, daughter of Malik Uthman Bariwal and wife of Hadrat Thani Mahdi (date not mentioned).

4. MISCELLANEOUS INSCRIPTIONS, GHOGHA, DISTRICT BHAVNAGAR.—Though a good number of inscriptions, mainly epitaphs of persons of various walks of life, belonging to the eleventh-twelfth century AD has been reported earlier, some more epigraphs have been copied from old Bohra graveyards.

¹ Information from : M.I. Quddusi, assisted by S.S. Hussain, M. Yasin Quddusi, G.S. Khwaja and M.A. Siddiqui of the Epigraphy Branch of the Survey, Nagpur. Two hundred and sixteen inscriptions were copied, examined and reported during the year under review, out of which important ones are noticed here.

EPIGRAPHY

Among the persons mentioned in the epitaphs, some of them seem to have been connected with commercial activities as traders and some being learned and saintly figures of the Bohra community. Among the deceased are: Qasim, son of Adam (AH 1012/AD 1604); Haji Bhai, son of Sumchi (AH 1071/AD 1661); Lad Bibi, daughter of Bodiya Bhai, son of Taj Bhai (AH 1080/AD 1669), Khaki Shah, son of Amani Shah Diwan (AH 1168/AD 1755); Hasan, son of Pir Bhai (AH 1210/AD 1795); Mulla Yusuf Ali, son of Mulla Abdul Qadir (AH 1228/AD 1813) and Rahman ji (son of) Bodha Khan (AH 1242/AD 1827).

5. MISCELLANEOUS INSCRIPTIONS, JHALOD, DISTRICT PANCHMAHALS.—Two Persian inscriptions in the verse form, one on the main gate and the other on the inner gate of the Jami Mosque, assign the construction of a beautiful mosque to one Jafar in AH 1134 (AD 1721-22). These records, though slightly damaged, are executed in pleasant Nastaliq characters.

MADHYA PRADESH

6. INSCRIPTION OF SULTANS OF MALWA, KAMPEL, DISTRICT INDORE.—This important Persian epigraph in beautiful Naskh calligraphy belonging to Alp Khan, better known as Hoshang Shah Ghorī (first discovered by S.K. Bhatt of Indore and later copied by the Epigraphy Branch, Nagpur of the Survey), records the completion of a mosque in AH 817 (AD 1414) by Abdul Halim Alp Khani, an humble servant of Husamu'd-Dunya wa'd-Din Azam Humayun Alp Khan (cf. *Cities, Towns and Republics in Ancient and Medieval India*, Vol. VII and VIII, 1989-1990 (Indore 1990), pp. 115-16).

MAHARASHTRA

7. MUGHAL INSCRIPTION, ASHTI, DISTRICT BEED.—This badly damaged Persian record of Shah Alamgir, i.e., Aurangzeb (AD 1658-1707), written in Nastaliq characters, registers the construction of a mosque with the efforts and under the supervision of Qadi (name lost) when (Nahar Khan) Ghorī was the Deshmukh (i.e., revenue officer) to the *Pargana*.

8. MUGHAL INSCRIPTION, PACHEGAON, DISTRICT BEED.—This metrical Persian record, executed in beautiful Nastaliq style, assigns the construction of a mosque (evidently the *idgah* on which it appears) to Muhammad Fadil *Saudagar* (i.e. trader) during the reign of Farrukh Siyar (AD 1712-19). It further records that the builder Muhammad Fadil belonged to a noble Ghorī tribe and originally hailed from Khushab (now in the Punjab province of Pakistan (pl. XXIX A).

9. MISCELLANEOUS INSCRIPTION, PIPLA JAGIR, DISTRICT BEED.—This Perso-Marathi bilingual inscription, fixed on a *haveli*, records in its Persian text (the construction of the *haveli* evidently on which it appears) by Sri Narsingh Sahai Janu Sarzi Rao Dule, *Muqaddam* (and) *Patwari* of *Mauda* Pepila Buzurg, *Pargana* Bir, *Tappa* Georai, in *Fasli* 1167 (AD 1757-58). Marathi version purporting the same as above is dated in Saka 1679 corresponding to the above-mentioned *Fasli* date.

10. MISCELLANEOUS INSCRIPTION, SIRSALA, DISTRICT BEED.—This badly damaged inscription, copied from the *dargah* of Shaikh Farid Tawakkal Allah, assigns the renovation (evidently of the said *dargah*) to Malik Mubarak, son of Khan-i-Azam Itimad Khan. Other details being lost, its calligraphy in Naskh characters tending to Rika is datable to the sixteenth century.

11. MISCELLANEOUS INSCRIPTION, UMAPUR, DISTRICT BEED.— This damaged metrical record in Persian, executed in Nastaliq hand, speaks about the installation of *Qadam-i-Rasul* (foot-print of the Prophet) by Sayyid Ibrahim who expired in AH 1179 (AD 1765). It further states that one Sayyid Husain was the spiritual successor of the deceased.

12. MISCELLANEOUS INSCRIPTION, HASNABAD, DISTRICT JALNA.—This loose and damaged Persian epigraph lying in the local *idgah* assigns the erection of an auspicious edifice (*i.e., idgah*) to Siddi Sarwar in AH 1125 (AD 1713). Its metrical text is carved in Nastaliq characters.

13. MISCELLANEOUS INSCRIPTION, RANJANI, DISTRICT JALNA.— This Persian epigraph records the construction of a mosque by Amir Ali, son of Husain Shah in AH 1173 (AD 1760).

RAJASTHAN

14. MUGHAL INSCRIPTIONS, JULMI, DISTRICT KOTA.— This badly damaged inscription in a crude Nastaliq hand recounts that this mosque of Shah Husain Sarwari, the disciple of Miran Shah Darwish Muhammad Bukhari, was built during the reign of Shah Jahan in the year AH 1067 (AD 1656). It further narrates that the camp (*dera*), garden, palace and mosque were erected during the time of Khuda Quli Khan (when he held the charge of the area).

Another badly damaged epigraph from the same village assigns the construction of a palace to one Janda Husain during the rule of Mughal emperor Shah Jahan.

One more fragmentary and damaged Persian inscription from Julmi, fixed in the *dargah* of Pir Husain in a garden, recounts that this garden which belonged to Shah Husain Sarwari had been laid out in the fourteenth regnal year (AH 1050-51/AD 1640-41) of Shah Jahan Badshah Ghazi. The record further warns that nobody, whether Hindu or Muslim, should interfere with its fixed boundaries. The name of the mason, Shaikh Mihr 'Ali, native of the village Zulm, is also recorded in this inscription.

UTTAR PRADESH

15. MISCELLANEOUS INSCRIPTION, ALIGARH, DISTRICT ALIGARH.—This epitaphic record in metrical Persian, executed in pleasant Nastaliq characters, records the death of a lady named Gul Begum in AH 1296 (AD 1879). The composer of the text was Qais.

16. MISCELLANEOUS INSCRIPTION, SASNI, DISTRICT ALIGARH.—This bilingual Perso-Urdu inscription assigns the construction of a mosque, obviously the Jami Mosque on which it appears, to Nawwab Mahmud Ali Khan in AH 1293 (AD 1876-77). The construction work was carried out under the supervision of Munshi Altaf Husain and the scribe of the text was Muhammad Yahya, the resident of Kol (now called Aligarh).

17. MISCELLANEOUS INSCRIPTION, BANSA, DISTRICT BARA BANKI.— This metrical Perso-Arabic bilingual record in pleasant Naskh and Nastaliq characters (inlaid) speaks about the erection of a mosque at the village Bansa in AH 1256 (AD 1840-41) by Ibrahim (entitled) Sharafud Daula Bahadur who held the post of *Qadi* in the town. In the Persian version, it is further elaborated that it was a new construction at the place of an old dilapidated mosque and was completed in AH 1257 (AD 1841-42). The composer of the text was Wathiq.

EPIGRAPHY

18. MISCELLANEOUS INSCRIPTIONS, RAHIMGANJ, DISTRICT BARA BANKI.— Of the three Persian epigraphs copied from this place, the first one is a metrical record assigning the excavation of a well to Shaikh 'Abdul' Ali in AH 1272 (AD 1855-56) for the merit of Hadrat Amir Ali, the great martyr.

Two other epitaphic records in their metrical texts, identical in purport, register the martyrdom of the same Amir Ali who had interestingly enough composed the metrical texts himself prior to attaining martyrdom in AH 1272 (AD 1855-56).

19. MISCELLANEOUS INSCRIPTION, GONDA, DISTRICT GONDA.—This damaged Persian record in its verses composed by Qadir assigns the erection of a mosque to Asad Ali Khan in AH 1265 (AD 1848-49).

20. MISCELLANEOUS INSCRIPTION, KHORASA, DISTRICT GONDA.— This brief Urdu inscription, set up later on, registers in Hijri and Christian era, the irregular dates AH 1132 and AD 1712 of construction, evidently of the mosque, on which it appears, at the instance of Begum Asafud Daula (of Lucknow). The dates mentioned in the epigraph do not coincide with the ruling period of Nawwab Asafud Daula (AD 1775-97).

21. MISCELLANEOUS INSCRIPTIONS, WAZIRGANJ, DISTRICT GONDA.— Of the two Persian epigraphs, the first one comprising a lone chronogrammatic hemistich records the construction of the 'House of God', literally a mosque, by one Jamshid in AH 1246 (AD 1830-31). The other record from a mosque named after its builder speaks about the construction of the mosque by Amir Bakhsh in AH 1256 (AD 1840-41).

22. MISCELLANEOUS INSCRIPTION, GORAKHPUR, DISTRICT GORAKHPUR.— This damaged Persian epigraph assigns the construction of (the replica of) a mausoleum in the name of Sayyid Salar Ghazi (i.e., Salar Masud Ghazi, the reputed eleventh century saint who lies buried at Bahraich) to a group of local tambourine-players (*dafaliyan*) of Gorakhpur city in AH 1225 (AD 1810-11).

WEST BENGAL

23. MISCELLANEOUS INSCRIPTION, PATASPUR, DISTRICT MIDNAPUR.— This Persian epigraph from Shahi Masjid states that construction of *Masjid-i-Mubarak Qadi* at Pataspur was completed in AH 1226 (AD 1811-12). Probably Mubarak Qadi was the builder of the mosque as it is named after him.

24. MUGHAL INSCRIPTION, PRATAPPUR, DISTRICT MIDNAPUR.— This important epigraph from the local Jami Mosque records the construction of the mosque during the reign of Aurangzeb by Qadi Bahaud Din in AH 1100 (AD 1688-89). This metrical Persian text also speaks highly of the builder Qadi Bahaud Din through whose efforts the religious tenets of Islam permeated the local society. The execution of the record in Thulth and Nastaliq characters is of a high order (pl. XXIX B).

25. MISCELLANEOUS INSCRIPTION, PRATAPPUR, DISTRICT MIDNAPUR.— This epitaphic record from a tomb near the Jami Mosque registers the name Qadi Bahaud Din, obviously the builder of the mosque mentioned above, and also the date AH 1100 (AD 1688-89), the year when he passed away.

III. NUMISMATICS AND TREASURE TROVE¹

ANDHRA PRADESH

1. GOLD COINS, KOTHAPALLI, DISTRICT RANGA REDDY.— Two gold coins of Achyutaraya (AD 1530-42) of *ganda-bherunda* and *sankha* and *ankusa* (conch and goad) types which are unique of its kind belonging to Vijayanagara period were discovered.

GUJARAT

2. MEDIEVAL COIN, VILLAGE DOLIYA, DISTRICT BHAVNAGAR.—A medieval coin probably belonging to middle eastern country was found from taluk Mahuva.

KARNATAKA

3. PANAMS, VILLAGE KOTTANUR, DISTRICT BANGALORE.—Two hundred and forty-seven Kantiraya *panams* were acquired as treasure trove from Uttarahalli Hobli.

4. GOLD ORNAMENTS, DISTRICT BELGAUM.— Six gold ornaments were acquired as treasure trove.

5. GOLD ORNAMENTS AND COINS, VENKATAPURA, DISTRICT BELLARY.—Twelve ornaments and nine coins were acquired as treasure trove.

6. SILVER COINS AND ORNAMENTS, DISTRICT CHIKMAGALUR.— Twenty-six silver coins and two ornaments were acquired as treasure trove.

7. GOLD VARAHAS, VILLAGE HOSUR, DISTRICT DHARWAD.—Twenty *varahas* of Ganga period were acquired as treasure trove from taluk Shiggon.

8. GOLD COINS, TAJ SULTANPUR, DISTRICT GULBARGA.— A hoard containing seventy gold coins of four major types, i.e., of Balakrishna and Garuda of *K.rishnadevaraya*, *ganda-bherunda* of Achyutaraya and Uma-Mahesvara of Sadasivaraya belonging to Tuluva dynasty of Vijayanagara empire was acquired as treasure trove.

9. COPPER COINS, VILLAGE THONDEBAVI, DISTRICT KOLAR.— Eleven copper coins were acquired as treasure trove from taluk Gauribidanur.

10. SILVER COINS, PANAMS AND ORNAMENTS, VILLAGE GANJAM, DISTRICT MANDYA.—Thirty-one silver coins of East India Company, two *panams* of Viraraja of Hoysala Viraballala III period and two ornaments were acquired as treasure trove from taluk Srirangapatna.

¹Information from: 1 and 8. Hyderabad Circle; 14-16, Bhopal Circle; 17. Epigraphy Branch, Nagpur; 18-25, Calcutta Circle, of the Survey; 2, Director of Archaeology and Museums. Government of Gujarat; 3-7 and 9-13, Director of Archaeology and Museums. Government of Karnataka.

NUMISMATICS AND TREASURE TROVE

11. PANAMS, DISTRICT MYSORE.— One hundred sixty-nine *panams* of Hoysala Vira ballala III period, one *panam* of Kantiraya Narasimharaja Wodeyar period and twenty-one panams from the province of Travancore king were acquired as treasure trove.

12. COPPER COINS, DISTRICT RAICHUR.— One hundred and thirty-five copper coins of Bahmani period were found at Raichur fort.

13. SILVER COINS, YEREGERE HOBBI, DISTRICT RAICHUR.— Four hundred and two silver coins of one-rupee denomination of East India Company were found as treasure trove from Mirzapur village.

MADHYA PRADESH

14. COPPER COIN, KARITALAI, DISTRICT JABALPUR.— One copper coin of a Muslim ruler was collected from the debris near Vishnu-Varaha temple at Karitalai.

15. COIN, SATDHARA, DISTRICT RAISEN.— One silver punch-marked coin was found from the surface near Buddhist monuments at Satdhara.

16. COPPER COINS, BERHAT, DISTRICT REWA.— Two ancient cast coins were collected in the vicinity of Buddhist stupas. One of them bears crescent-on-hill, cross and elephant symbols.

MAHARASHTRA

17. BAHMANI COINS, LADKHED, DISTRICT YEOTMAL.— A hoard consisting of one hundred and three copper coins was received from the Thana Incharge of Ladkhed Police Station for study and a report there on. The hoard was discovered from the ancestral house of Abdul Said, son of Abdul Hamid, the resident of Ladkhed, during a digging operation. The coins belong to the Bahmani rulers Tajud Din Firuz Shah (AH 800-25/AD 1397-1422), Shihabud Din Ahmad Shah I (AH 825-38/AD 1422-35). Alaud Din Ahmad Shah II (AH 838-62/AD 1435-57) and Alaud Din Humayun Shah (AH 862-66/AD 1457-61). Most of these coins were issued from Ahsanabad (i.e., Gulbarga) and Muhammadabad (i.e., Bidar) mints. After a study, the hoard has been handed over to the concerned police authority.

WEST BENGAL

18. METAL OBJECT, COOCH BEHAR TREASURY, DISTRICT COOCH BEHAR.— One metal flower vase (35 cm high), kept under the custody of the Cooch Behar Treasury, was inspected by Shantanu Maiti of the Calcutta Circle of the Survey.

19. STONE HEAD, DINHATA, DISTRICT COOCH BEHAR.— One stone head of a deity, kept under the custody of Dinhata Police Station, was examined by Shantanu Maiti of the Calcutta Circle of the Survey.

20. BANSIDHARI KRISHNA, SILIGURI, DISTRICT DARJEELING.— Shantanu Maiti of the Calcutta Circle of the Survey reported the discovery of an image of Krishna playing on a flute measuring 43 X 17 X 9 cm in C.I.D. Office, Siliguri.

21. IMAGES OF KRISHNA, RADHA AND UMA-MAHESVARA, SILIGURI, DISTRICT DARJEELING.— A.K. Bandyopadhyay of the Calcutta Circle of the Survey examined four images kept in the custody of the Assistant Collector of Customs, Siliguri Division. Those were: Uma-Mahesvara in black basalt (68 X 26.5 X 8 cm) datable to the thirteenth-fourteenth century; standing Krishna in metal (33 X 14.3 X 9.3 cm)

datable to c. eighteenth century; standing image of Radha in metal (25.3 X 16 X 8 cm) datable to c. seventeenth-eighteenth century; Krishna in metal (46.5 X 22.5 X 14.5 cm) datable to c. seventeenth-eighteenth century.

22. RADHA AND VISHNU IMAGES, SILIGURI, DISTRICT DARJEELING.— A.K. Bandyopadhyay of the Calcutta Circle of the Survey examined three images of Vishnu and two of Radha at the office of the Deputy Controller of Central Excise and Customs, Siliguri.

23. STONE PLAQUE, SILIGURI, DISTRICT DARJEELING.— A.K. Bandyopadhyay of the Calcutta Circle of the Survey reported one stone plaque carved in low relief with ten incarnations of Vishnu on one side and the figure of seated Vishnu on the other side at Siliguri Police Station.

24. NINETEEN IMAGES, RAIGANJ POLICE STATION, DISTRICT NORTH DINAJPUR.— Nineteen images datable between the tenth and the nineteenth century were acquired by Shantanu Maiti of the Calcutta Circle of the Survey and kept in Raiganj Police Station. These included Uma-Mahesvara (87 X 47 X 6.5 cm) seated on a lotus in *sukhasana mudra* in black basalt (pl.XXX A); Yamuna (pl.XXX B) on *kurma* in stone (1.25 X 53 X 23 cm); two-armed male deity (Surya ?) standing in *samapada* on a lotus seat against a richly-carved backdrop (1.30 X 62 X 15 cm); two-armed Siva standing (1.15 X 46 X 15 cm) on a lotus (pl.XXX C); eight-armed Chamunda (1-22x50x15 cm) of black stone dancing on a corpse placed on lotus (pl. XXX D); five Vishnu (pl. XXXI A) images (1.15 X 50 X 15 cm; 100 X 45 X 15 cm; 62x20x7 cm; 50x20x9 cm; 36x18x8 cm); two Ganesa images, one with eight arms in dancing pose (pl.XXXI B) (20 X 15 X 6 cm) while the other in marble, seated on raised *pitha*; black stone image of Lakshmi in *lalitasana*; standing two-armed female deity (Parvati) in black stone (27 X 14 X 9 cm), besides a panel showing Uma-Mahesvara, sculptures of Radha and Venugopala.

25. Six SCULPTURES, BANGARH, DISTRICT SOUTH DINAJPUR.— Shantanu Maiti of the Calcutta Circle of the Survey collected a damaged figure of pot-bellied deity (16 X 14 X 5.5 cm) standing probably in *samapada-sthanaka* pose wearing *vanamala*, necklace and *upavita*, identified as Kubera assignable to c. tenth-twelfth century; a damaged bust of a female deity (17.5 X 8.5 X 7.5 cm), datable to c. tenth-eleventh century; fragment of a sculpture (32 X 19 X 11 cm); a stone pillar; one phallus and a carved stone-block.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. JAINA SCULPTURES, HILL FORT, RAYADURG, DISTRICT ANANTAPUR.— D.R. Gehlot, along with J. Vara Prasada Rao, R.Y. Krishna Rao, and C.C. Chalapati of the Hyderabad Circle of the Survey, discovered four loose Jaina sculptures of Parsvanatha, *yaksha*, *chovisi* with inscription on the pedestal (with head of *mulanayaka*, mutilated) and an inscribed memorial slab (*nishidi-stone*) datable to medieval period. These were found buried under the disturbed floor of a ruined temple in the hill fort. The inscriptions are in Telugu-Kannada language.

2. ACHEULIAN TOOLS, ADIREDDIPALLE, DISTRICT CUDDAPAH.—Acheulian tools including handaxes, cleavers, etc., were discovered at Adireddipalle by J. Vara Prasada Rao and R. Krishnaiah of the Hyderabad Circle of the Survey.

3. MAHACHAITYA, AMARAVATI, DISTRICT GUNTUR.— While carrying out scientific clearance to level the area around *maha-chaitya*, lead coins of Ikshvaku period were found by the Hyderabad Circle of the Survey.

4. INSCRIPTIONS, UTUKURU, DISTRICT NELLORE.— The Hyderabad Circle of the Survey noticed two inscriptions belonging to medieval and late medieval periods engraved on a stone-slab and a small *sati-piNar* respectively.

5. SCULPTURES, UTUKURU, DISTRICT NELLORE.— Loose sculptures of Virabhadra, hero-stones. *panavattas*, *lingas* and Chamundi, etc. of medieval period were discovered by D.R. Gehlot, accompanied by R.V. Siva Sarma, J. Vara Prasada Rao, R.Y. Krishna Rao of the Hyderabad Circle of the Survey.

6. SCULPTURE, KOTHAPALLY, DISTRICT RANGA REDDY.— The Hyderabad Circle of the Survey reported the discovery of a stone figure of Hanumana carved on a granite boulder belonging to Vijayanagara period.

7. SCULPTURES, MADHAVADHARA, DISTRICT VISHAKHAPATNAM.— While digging near Madhavasvamy temple, loose sculptures of standing Surya, Karttikeya and Vishnu belonging to early medieval period were discovered at Madhavadhara by D.R. Gehlot, R.V. Siva Sarma, R. Krishnaiah, and R.Y. Krishna of the Hyderabad Circle of the Survey.

GUJARAT

8. SCULPTURES AND ARCHITECTURAL REMAINS, DISTRICTS BHAVNAGAR, JUNAGARH AND MAHESANA. — The Department of Archaeology, Government of Gujarat, reported the discovery of a G^h/V/-Lakshmi from Shihor (twelfth-thirteenth century) in District Bhavnagar and *yakshi* (eighth-ninth century) in

District Junagarh; fragmentary door-frame from Vadnagar (twelfth century); a *Navagraha* panel from Dabhadi (Solanki period); an *eka-mukha linga* and upper part of *parikara* from Sankhari (seventh and ninth century respectively); images of Tirthankara from Pali (tenth century); Uma-Mahesa from Kuder (sixteenth century) in Kherala taluk; Ganesa, Brahmi, Vaishnavi, Mahesvari, Aindri and Kaumari from Kotia (seventh-eighth century) in Patan taluk, District Mahesana.

KARNATAKA

9. STONE INSCRIPTION, HOLANGADDE, DISTRICT UTTARA KANNADA.— In the course of village-to-village survey, K.G. Bhatsoori of the Directorate of Archaeology and Museums, Government of Karnataka brought to notice a stone inscription in Kannada characters of the eleventh-twelfth century.

10. INSCRIPTIONS, NAGUR, DISTRICT UTTARA KANNADA.— K.G. Bhatsoori of the Directorate of Archaeology and Museums, Government of Karnataka reported the discovery of two stone inscriptions in the premises of Vishnu temple, one written in Kannada script while the other in Tamil script of the eleventh-twelfth century.

KERALA

11. MENHIR, DISTRICT KOLLAM.— P.Sreedharan of the Department of Archaeology, Government of Kerala, located a menhir near Trikkadavoor Mahadeva temple.

12. ROCK-CUT CAVE, KADAVALLLOOR, DISTRICT THRISSUR.— The Department of Archaeology, Government of Kerala, located a rock-cut cave in laterite rock at Kadavallloor near Kunnamkulam.

MADHYA PRADESH

13. STRUCTURES, KASHITOLA, DISTRICT BALAGHAT.— D. Dayalan of the Bhopal Circle of the Survey noticed an old brick structure of Kalachuri period near Kashitola.

14. TEMPLE AND SCULPTURAL REMAINS, DISTRICTS BALAGHAT, MANDLA AND SHAHDOL.— Rekha Radha Ballabhi and Jagdish Prasad of the Bhopal Circle of the Survey, under the Narmada Project, surveyed twenty-six villages and noticed ruined temple and sculptural remains at Alna, District Balaghat; Patharkuteka, District Mandla and Koilari, District Shahdol, datable to the eleventh-twelfth century.

15. SCULPTURE, PAWAYA, DISTRICT GWALIOR.— D. Dayalan of the Bhopal Circle of the Survey noticed one *eka-mukha Siva-linga* near the ancient site.

16. SCULPTURES, KARITALAI, DISTRICT JABALPUR.— D. Dayalan, Rekha Radha Ballabhi and S.N. Shrivastava of the Bhopal Circle of the Survey noticed several architectural members besides images of Vishnu and his various forms, Lakshmi, Siva, Bhairava, etc.

17. SCULPTURES, KUKARRAMATH, DISTRICT MANDLA.— D. Dayalan of the Bhopal Circle of the Survey noticed fragmentary images of Vishnu along with his incarnations and *parikara* part of Vishnu idol, etc.

18. RAILING PIECES AND POTTERY, SANCHI, DISTRICT RAISEN.— During the course of conservation of a bulged-out portion of a wall near Temple 31 at Sanchi, a few railing pieces of Sunga period decorated with lotus designs and Gupta pottery were collected.

OTHER IMPORTANT DISCOVERIES

19. ROCK-SHELTER, BHIMBETKA, DISTRICT RAISEN.— Shivananda V. and Narayan Vyas of the Bhopal Circle of the Survey discovered a painted rock-shelter near Group III of Bhimbetka, depicting animal and human figures, painted in red colour.

20. SCULPTURE, RAISEN FORT, DISTRICT RAISEN.— Narayan Vyas of the Bhopal Circle of the Survey noticed on the way to fort an image of river goddess probably of Yamuna.

21. MISCELLANEOUS OBJECTS, BERHAT, DISTRICT REWA.— During the course of debris clearance at Stupa 26, sherds of NBP representing dish and bowls, stone beads, etc. were collected by the Bhopal Circle of the Survey.

22. SCULPTURES, MAIHAR, DISTRICT SATNA.— Narayan Vyas and H. Michael of the Bhopal Circle of the Survey noticed broken Brahmanical images in the vicinity of Maihar hill.

23. MINIATURE SCULPTURE, UDAYGIRI, DISTRICT VIDISHA.— R.S. Shrivastava of the Bhopal Circle of the Survey collected a stone plaque depicting seated Ganesa datable to fifth century.

24. SCULPTURES, VIDISHA, DISTRICT VIDISHA.—Bhopal Circle of the Survey reported the discovery of a few fragmentary heads of deities during the course of desilting the step-well near Bijamandal.

TAMIL NADU

25. INSCRIPTIONS AND STONE SCULPTURES, DISTRICT ALAGU MUTHUKKON.— The Director of Archaeology and Museums, Government of Tamil Nadu, reported the discovery of two Pandya inscriptions of the thirteenth century AD from Amur and Rajapalayam. Also reported were three stone sculptures and a few memorial stones from Kandamanur and Iakkampatti near Theni.

26. BRONZE PAVAI LAMP, PONNERI, DISTRICT ANNA.— D. Gopalan of the Department of Archaeology and Museums, Government of Tamil Nadu, noticed a Pavai lamp of bronze at Ponneri. which belongs to the eighteenth century.

27. ARCHITECTURAL MEMBERS, SHORE TEMPLE COMPLEX, MAHABALIPURAM, DISTRICT CHENGALPATTU-M.G.R.— In continuation of the last year's work (1992-93, p. 116), further clearance of accumulated sand in the southern portion of the Shore temple led to the discovery of yet-to-be identified architectural and artistic activity along the bed-rock running north to south across the temple-complex. The remains included two circular blocks forming the *pada* portion of yet another miniature shrine (1990-91, pp.62-63), a bulbous *padma* and a square *phalaka* of pillar besides other architectural members. A 0.60m square socket of about 0-20 m depth was found cut into the southern extreme of the bed-rock, possibly for erecting a square pillar, like the one in the east.

The blocks of the miniature shrine have provision for an entrance made by cutting off a segment. On the exterior, there are four pilasters in relief with *simha-pada*, one each on either side of the entrance and two in the diametrically opposite points to the above. The *simha-pada* motifs indicate that the shrine belonged to the reign of Narasimhavarman II Rajasimha (AD 700-727). It is impossible to ascertain the exact location of the erection of this shrine as the other component members are missing. This shrine, nevertheless, differs from the one on the northern side of the temple that the *pada* portion of the present

shrine is 'structural' as it consists of two blocks instead of single block of stone used in the earlier shrine, the appearance of typical *simha-pada* pilaster and the absence of any cult image on the inner wall of the shrine.

The other notable architectural members are the bulbous *padma* and the square *phalaka* members of a pillar. Both are engraved with epithets of Narasimhavarman II Rajasimha in the usual Pallava Grantha script.

It is difficult to ascertain the origin and exact archaeological context of these members as they were found dumped along with boulders in the sand in the area of operation.

28. HERO-STONES AND COINS, DISTRICT COIMBATORE.— Hero-stones ranging in date from the fourteenth to sixteenth century, were found at Ukkadam and Iruthappalli in District Coimbatore by R. Selvaraj of the Department of Archaeology, Government of Tamil Nadu. At Avinasi in the same District, a coin of Rajaraja Chola I, the other of Mysore Udaiyar and the third of the Dutch coin, the last-mentioned one bearing the year 1754 were also collected.

29. ICON OF DURGA, SINGAPURAM, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— K. Muthusamy of the Department of Archaeology and Museums, Government of Tamil Nadu, reported the discovery of a sculpture of Mahishamardini Durga (pl. XXXI C) of the seventh century from Singapuram in Gingee taluk. Standing in *tri-bhanga*, she holds wheel, sword, dagger and arrow in the four left hands while conch, shield, knife and arrow in the four right hands. Two squatting figures of devotees are carved below the standing image of Durga.

30. SCULPTURES, ANANKUR, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— K. Muthusamy of the Department of Archaeology and Museums, Government of Tamil Nadu, noticed an image of Indra or Muruga seated on an elephant, wearing a different type of *mukuta*, a thick necklace and *vaguvalaya*, at Anankur, datable to the sixth-seventh centuries AD.

Among other sculptures noticed in and around the same village, sculptures of Ga'a-Lakshmi and a group of *sapta-matrikas* are noteworthy.

UTTAR PRADESH

31. TEMPLE AND SCULPTURES, DISTRICT ALMORA.— Hem Raj of the Regional Archaeological Organization, Government of Uttar Pradesh, noticed a late medieval *nagara* temple and sculpture from village Udhana.

32. COPPER PLATES, DISTRICT PITHORAGARH.— Rakesh Tewari of the Regional Archaeological Organization, Government of Uttar Pradesh, reported the discovery of seventeen copperplates, mainly land grants from the village of Pithoragarh.

WEST BENGAL

33. TEMPLE, BAHIRGARH, DISTRICT HOOGHLY.— T.J.Chakraborty of Calcutta Circle of the Survey located at village Bahirgarh a brick-temple of Damodar Deb (Narayana) of ornate *atchala* style.

V. RADIOCARBON DATES¹

The following radiocarbon measurements were made on archaeological and Quaternary samples² during the period (April 1993 to March, 1994). All the dates are based on 5730 ± 40 years half life value of radiocarbon. The year 1950 is the base year to convert these dates into AD/BC scale. All the dates are uncorrected for $14c/12c$ variation.

GUJARAT

1. CHANDAURI, DISTRICT KACHCHH

PRL-1709. Harappa Culture

Oyster shell from a limestone rock substratum > 38,000

Sender's Sample No. II

2. DHOLAVIRA, DISTRICT KACHCHH

i. PRL-1711. Harappa Culture

Charcoal from Trench 48 X 93 X 4+1 Layer 4;
Locus 48 X 93X 4+1; Depth 10.48 m Sender's
Sample No. 1/93 3910±90

ii. PRL-1712. Harappa Culture

Charcoal from Trench 48 X 93 X 4+1 Layer 4;
Locus 48 X 93 X 4+1; Depth 10.48 m Sender's
Sample No.2/93 Modern

iii. PRL-1713. Harappa Culture

Charcoal from Trench 48 X 92 X 4 Layer
40; Locus 48 X 92 X 4; Depth 7-40 m
Sender's Sample No. 3/93 3100±90

iv. PRL-1715. Harappa Culture

Charcoal from Trench 48 X 92 X 2+1 Layer 25;
Locus 48 X 92 X 1+2; Depth 3.90 to 4.10 m
Sender's Sample No. 5/93 4230±90

¹Contributed by Sheela Kusumgar and M.G. Yadava of the Physical Research Laboratory, Ahmedabad. Further details of the samples can be obtained from the excavators whose address is given below.

²Samples submitted by : 1,9,10, Physical Research Laboratory, Ahmedabad; 2, Institute of Archaeology, New Delhi; and 8, Excavation Branch IV, Bhubaneshwar, of the Survey; 3, Department of Archaeology and Ancient History, Baroda; 4, Deccan College, Pune; 5, University Museum, 93rd and Spruce Streets, Philadelphia, USA; 6, Directorate of Archaeology and Museums, Mysore; 7, Italian Embassy, Cultural Centre, New Delhi.

- | | | |
|--------------------------------|---|-----------|
| v. | PRL-1716. Harappa Culture
Charcoal from Trench 57 X15 X
1 Locus 57 X 15 X 1; Depth
1.15 cm Sender's Sample No.
6/93 | 3400±90 |
| vi. | PRL-1718. Harappa Culture
Charcoal from Trench 55x24x1
Layer 41; Locus 55 X 24 X1
Depth 6.29 to 6.38 m Sender's
Sample No. 8/93 | 3440±90 |
| vii. | PRL-1719. Harappa Culture
Charcoal from Trench 55 X 24
X1 Layer 31; Locus 55 X 24 X 1
Depth 3.89 m. Sender's Sample
No. 9/93 | 4390±90 |
| 3. LOTESWAR, DISTRICT MAHESANA | | |
| i. | PRL-1564. Chalcolithic
Charcoal from Trench I Layer PIT-2;
Locus sub-square B Depth 1 .25 m
Sender's Sample No. LTS.1 | 4460± 110 |
| ii. | PRL-1565. Chalcolithic
Charcoal from Trench I, Layer PIT-4,
Layer 2; Locus sub-square A Depth 1.3 m
Sender's Sample No. LTS.2 | 5050± 110 |
| iii. | PRL-1567. Mesolithic
Charred bone from Trench I,
Layer 4; Depth 1 .43 to 1.55 m
Sender's Sample No. LTS.4 | 6010±120 |
| 4. PADRI, DISTRICT BHAVNAGAR | | |
| i. | PRL-1784. Pre-Harappan
Charcoal from Trench TTM A2 (NW)
Layer 9; Locus NE (Lot No. 120128)
Depth 2.0m | 3770±100 |
| ii. | PRL-1785. Pre-Harappan
Charcoal from Trench LX1 (NE) Layer 7;
Locus NE (Lot No. 10026) Depth 1 .47 m | 4520±100 |

RADIOCARBON DATES

iii.	PRL-1786. Pre-Harappan Channel from Trench LX1 (NE) Layer 8, Locus NE (Lot No. 10034) Depth 1 .95 m	3850±100
iv.	PRL-1787. Pre-Harappan Charcoal from Trench LX1, Layer 10 Locus NE (Lot No. 10041) Depth 2.68 m	4960±100
5.	ROJDI, DISTRICT RAJKOT PRL-1704. Harappa Culture Charcoal from Trench 46 P Layer-Stratum 3, Depth 0-82 m Sender's Sample No. Lot 23135	5880±60
KARNATAKA		
6.	WATGAL, DISTRICT RAICHUR	
i.	PRL-1575. Southern Neolithic Charcoal from Trench A2 Locus near the eastern part of the Trench, Depth 3-6 m Sender's Sample No. Lot 017	43 50± 100
ii.	PRL-1576. Southern Neolithic Charcoal from Trench A2 Locus near western corner of the Trench, Depth 3-8 m Sender's Sample No. Lot 016	4040±90
iii.	PRL-1580. Megalithic Charcoal from Trench A2 Locus central part of the Trench Depth 2-6 m Sender's Sample No. Lot 010	3510±100
OMAN		
7.	EASTERN OMAN	
	PRL-1659. Harappan Trade Mussels from site RJ-2 Sender's Sample No.B 3050, QEV-2792	2300± 100

ORISSA

8. GOLBAI SASAN, DISTRICT PURI

- | | | |
|------|---|----------|
| i. | PRL-1637. Chalcolithic
Charcoal from Trench B 1/Qdt. 1 Layer 13;
Depth 3-9 m Sender's Sample No.
CS/HLB-91-92/2 | 4100±100 |
| ii. | PRL-1641. Chalcolithic
Charcoal from Trench A 1/Qdt. 3 Layer 15;
Depth 2-4 m Sender's Sample No.
CS/GLB-91-92/6 | 2600±90 |
| iii. | PRL-1642. Chalcolithic
Charcoal from Trench A 1/Qdt. 2 Layer 4;
Locus A1-8-55 m/B 1-4-45 m Depth 1.55 m
Sender's Sample No. CS/GLB-91-92/7 | 4310±100 |
| iv. | PRL-1646. Neolithic
Charcoal from trial trench Layer 18; Depth
4-65 m Sender's Sample No.
CS/GLB-90-91/4 | 2710±90 |

UTTAR PRADESH

9. ULENI, DISTRICT ALMORA

- | | | |
|-----|--|---------|
| i. | PRL-1648. Upper Palaeolithic
Charcoal from rock-shelter
Sender's Sample No. 18 | 2770±90 |
| ii. | PRL-1649. Upper Palaeolithic
Charcoal from rock-shelter
Sender's Sample No. 18 (a) | Modern |

10. GAGARIAGOL, DISTRICT ALMORA

- | | |
|---|-----------|
| PRL-1592. cist-burial
Charcoal from cist-burial
Depth 3.5 m
Sender's Sample No. 2/92 | 4180± 100 |
|---|-----------|

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS¹

The report incorporates the results of investigation carried out at Birbal Sahni Institute of Palaeobotany, Lucknow, on the plant remains from the excavation at Manjhi in Bihar, Banawali in Haryana and Sanghol in Punjab.

BIHAR

1. MANJHI (25°50' N; 84°34'E), DISTRICT SARAN.— In continuation of the last year's (1992-93, p. 123) work, further investigation brought to light the remains of pigeon-pea (*Cajanus cajan*), Italian millet (*Setaria italica*), moth-bean (*Vigna aconitifolia*), kodon millet (*Paspalum scrobiculatum*), field brassica (*Brassica juncea*) and til (*Sesamum indicum*) in the food and crop economy.

A large number of weeds and other wild taxa including the remains of the species of *Andropogon*, *Amaranthus*, *Carex*, *Cyperus*, *Elaeocharis*, *Panicum*, *Euphorbia*, *Fimbristylis*, *Indigofera*, *Jaquemontia*, *Solarium* and *Trigonella*; *Argemone mexicana*, *Chenopodium album*, *Cleome viscosa*, *Commelina benghalensis*, *Dactyloctenium aegyptium*, *Desmodium gangeticum*, *Echinochloa crus-gallii*, *Eleusine indica*, *Kochia indica*, *Lathyrus aphaca*, *Lathyrus sphaericus*, *Melilotus indica*, *Medicago sativa*, *Polygonum barbatum*, *Rumex dentatus*, *Trianthema portulacastrum*, *Vicia sativa* and *Ziziphus oenoploea* were also identified. A few more remains are still left for identification.

HARYANA

2. BANAWALI (29°37'5"N; 75°23'6"E), DISTRICT HISSAR.— While collecting the carbonized plant remains from a wide range of deposits as a source of information on past human activities in pre-Harappan times (2750-2500 BC), two samples were collected from layer 17 at the depth of 2-70 m and 3-70 m in Trench IV.

Sample collected at a depth of 3-70 m (pl. XXXII) contains the fruits of south Indian soap-nut tree (*Sapindus* cf. *emarginatus*). There is a difference of opinion regarding the identity and correct nomenclature of the closely allied plants mentioned under the names *S. trifolius* Linn., *S. laurifolius* Vahl. and *S. emarginatus* Vahl. Some authors mention them as synonyms of *Sapindus trifolius*, while others regard them as two distinct species. It is common on the coast and in the open forests at low elevations in the regions of the Deccan and Karnataka, Konkan and Karnataka and also in coastal Gujarat. Occurrence of south Indian soap-nut (*reetha*) in the pre-Harappan times at Banawali is in no way accidental and may be regarded to have been exploited for some specific purpose. Fruits are

¹Contributed by K.S. Saraswat, Chanchala Srivastava and A.K.S. Pokharia of the Birbal Sahni Institute of Palaeobotany, 53 University Road, Lucknow-226007.

valued for saponin and universally used as a substitute for soap to clean clothes, hair and jewellery. In view of this fact, the evidence of south Indian soap-nut suggests the use of this herbal detergent by pre-Harappans in the region of Punjab.

The other sample of carbonized material, recovered at the depth of 2-70 m, is also of exceeding importance. Mixture of south Indian soap-nut (*Sapindus* cf. *emarginatus* Vahl), fruits of *anwla*/emblic myrabolan (*Embolia officinalis* Gaertn.) and the pod and seed remains of *shikakai* (*Acacia rugata* (Lamk.) Ham.— Syn. *A. concinna* DC) in the sample bears ample testimony to the richness of experience and understanding of the properties of plant products which enabled pre-Harappans to synthesize the herbal shampoo. Saponiferous fruits of soap-nut are preferred to the best soap for washing hair. Dried fruits of *anwla* are also detergent and used for shampooing hair. Fixed oil in the *anwla* fruits, having a number of fatty acids, promotes hair growth. *Anwla* trees are found throughout India, chiefly in dry deciduous forests. Prickly, scandent bushes of *shikakai* occur in dry deciduous forests, especially in the Deccan. Its dry pods under the name of '*shikakai*' are extensively used as detergent and preferred to soap. *Shikakai* does not leave the skin dry. It is amazing that the use of the compound preparation of herbal shampoo, universally practiced in India, has much deeper roots in prehistory, pre-Harappan times (circa 2750-2500 BC) in the archaeological context of the sub-continent.

So far, the considerations of health and hygiene were evident in the pre-Harappan and Harappan civilization, as also reflected in the geometrical planning of cities, well-ventilated streets, baths and a well-developed system of drainage, to which special care seems to have been given from the technical point of view. Now, the use of herbal detergent and shampoo evidenced from Banawali (pl. XXXII) denotes the high standard of hygiene in the pre-Harappan and Harappan communities. Not only for the Indian sub-continent, the evidence is unique in the World archaeological context.

PUNJAB

3. SANGHOL (30°47"N; 76°23"E), DISTRICT LUDHIANA.— From the Kushan period (first-third century AD), the grains and seeds of the crop plants include rice (*Oryza sativa*), bread-wheat (*Triticum aestivum*), dwarf wheat (*T. sphaerococcum*), hulled barley (*Hordeum vulgar e*), naked barley (*H. vulgare* var. *nudum*), jowar millet (*Sorghum bicolor*); chick-pea/gram (*Cicer arietinum*), field-pea (*Pisum arvense*), lentil (*Lens culinaris*), green-gram/mung (*Vigna radiata*), black-gram/urad (*V. mungo*), cow-pea/lobia (*Vigna unguiculata*), grass-pea/khesari (*Lathyrus sativus*), sesame/til (*Sesamum indicum*), field-brassica/brown mustard (*Brassica juncea*) and cotton (*Gossypium arboreum/herbaceum*). Cotyledons of hyacinth-bean/sem (*Lablab purpureus*) have brought to light the evidence of responsiveness in Kushan times to intensive management practice for the cultivation of this vegetable legume.

In the realm of spices and condiments, fenugreek (*Trigonella foenum-graecum*), coriander (*Conundrum sativum*), cumin (*Cuminum cyminum*) and black pepper (*Piper nigrum*) (pl. XXXIII B,D,E), fenugreek is known to have been used in India since Harappan times. Coriander and cumin of Mediterranean region and black pepper of Indo-Malaysian region, from the Kushan period of Punjab are new records in the archaeological context of the sub-continent.

Fruit remains include grape (*Vitis vinifera*), almond (*Prunus amygdalus*) (pl. XXXIII C), walnut (*Juglans regia*) (pl. XXXIII, G), date (*Phoenix dactylifera/sylvestris*), phalsa (*Grewia* cf. *asiatica*), jujube (*Ziziphus nummularia*), jambolana (*Syzygium cumini*) (pl. XXX III, H), anwla (*Embllica officinalis*) Chebulic myrabolan/haritaki (pl. XXXIII, I), (*Terminalia chebula*), south Indian soap-nut (*Sapindus emarginatus*) (pl. XXXIII, F) and custard-apple (*Annona squamosa*) (pl. XXXIII A).

Among these fruit remains, exploited by the ancient settlers for edible and other purpose, the south Indian soap-nut is of particular significance.

Occurrence of South American custard-apple fruit in the Kushan period is not explainable in the present state of botanical knowledge. The diffusion of this fruit-tree between continents may be seen as an historical incidence in the context of human exploration. The custard-apple is believed to have been introduced into India by the Portuguese, probably in the sixteenth century (G. Watt, *A Dictionary of the Economic Products of India*, I, Calcutta, 1889; K.L. Mehra *Indian Horticulture*, Oct-Dec, 1965). On this ground, the identification of this fruit amongst the Mathura sculptures by Cunningham was opposed by botanists. Cunningham also appealed to one of the Bharhut sculptures (about second century BC) for a very exact representation of the fruit and leaves of the custard-apple. Further, a leading palaeobotanist (R.V. Sitholey, 'Plants Represented in Ancient Indian Sculpture', *Geophytology*, 6(1): 15-26) in 1976 in his critical study of forty representations of plants in the bas-reliefs on the gateways of the Great stupa at Sanchi and the railing of the Bharhut stupa (first-second century BC) has also supported the observations by Cunningham and described the same as custard-apple. Now, factual evidence of custard-apple fruit from the Kushan period at Sanghol cannot be ignored. The purpose of this report is not to dispute the introduction of custard-apple by Portuguese in the sixteenth century. The occurrence of the factual evidence of this fruit in the economy of Kushans in India would indubitably bother the botanists and archaeologists both. In view of this fact, it is left to the scholars to decide whether or not this evidence should be taken for an American-Asian contact in earlier times, before the discovery of America by Columbus.

VII. MUSEUMS

1. TAJ MUSEUM, TAJ MAHAL, AGRA.— The worn-out background cloth of the showcases along with mounting of painting and other objects were replaced.

2. GOVERNMENT MUSEUM, AJMER.— During the period under review, wooden pedestals and frames were prepared for sculptures, inscriptions, etc., besides the write up and maps indicating the genealogy of the Chauhan kings of Ajmer. Steps were also taken to provide sufficient lights in the galleries. The exhibits were also cleaned and classified.

3. ALLAHABAD MUSEUM, ALLAHABAD.— The museum acquired through purchase one hundred and eighty-eight objects including fifty gold, twenty-one silver, five lead and fifty-four copper coins, sixteen terracotta objects, three terracotta seals, one pottery, three bronzes, one shield, one miniature painting, two modern paintings, one textile and thirty documents relating to literary luminaries. Notable among these include gold coins of Selucid dynasty depicting portrait of king and mother and child (second century BC) and Kushan king Vasudeva with Siva and Nandi (second century AD); terracotta spout depicting an elephant head with upraised trunk (second century BC); mother goddess in terracotta (second century AD) and miniature painting of Bikaner school showing a portrait of royal personage (early nineteenth century AD).

The museum also organized three national level seminars on '*Science and Society*' (18-20 October, 1993); '*ArtofKausambi*' (20-21 February, 1994) and '*Formation of Indian Culture*' (11-13 March, 1994), jointly with ICHR and ICPR and six other seminars on '*SahityikRachana Va Rashtriya Chetana*' (17-18 April, 1993), '*Shamsher Bahadur Singh Smriti*' (26 may, 1993), '*Rahul Katha Sahitya*' (17-18 July, 1993), '*UpanyasaAurltihasaDrishtV*' (9January, 1994), '*I857KaMuktiAndolan*' (27-28January, 1994) and '*Agyeya Va Tarspatak*' (18-19 March, 1994) under the Project of Literary and Cultural History of Allahabad. Besides, the Museum also arranged exhibitions on 'Art of Kausambi' (20 February to 15 March, 1994), 'Poster Exhibitions' (17-25 April, 1993), 'Painting Exhibition' (15-18 April, 1993), 'Kriti-93' (6-16 August, 1993), 'Gaurav Nagari-Allahabad' (21 December, 1993 to 10 February, 1994) in collaboration with other organizations.

Nineteen illustrated lectures were also arranged along with workshops on paintings (six), clay-modelling (two) and a summer course on 'History of Indian Art and Culture' for the students besides organizing programmes to facilitate Naresh Mehta and Prabhat Shastri and in the memory of late K.P. Jayaswal and Stella Kramrisch.

The museum also published three books on '*Smarana Evam Shraddhanjali Parva Prasanga*', '*Upanyasa Aur Itihasa*' and '*Indian Art and Culture*', a coloured folder on the museum in Hindi besides a number of other folders, booklets and two sets of picture postcards.

MUSEUMS

During the period under review, the museum acquired one thousand four hundred books and seven hundred and thirty-three objects were treated chemically and three thousand objects photo-documented. Eight hundred and twelve plaster of Paris, fibre-glass replicas were prepared.

4. ARCHAEOLOGICAL MUSEUM, AMARAVATI.— The work of vinatyle flooring of galleries was completed. A brochure on the museum was brought out.

5. ARCHAEOLOGICAL MUSEUM, BADAMI.— Masonry pedestals for displaying huge sculptures were prepared and exhibits were arranged in chronological order.

6. ARCHAEOLOGICAL MUSEUM, BIJAPUR.—The museum acquired an image of Ganesa, assignable to early Chalukyan period.

Island show-cases for display of minor objects in Gallery 3 and 6 were prepared.

7. ARCHAEOLOGICAL MUSEUM, BODHGAYA.— A shed was prepared for loose sculptures. The lawn of the museum was developed.

8. ARCHAEOLOGICAL MUSEUM, CHANDRAGIRI.— The works of preparation of pedestals, show cases and vinatyle flooring of galleries were completed. The Bronze and Miscellaneous Galleries were provided with grills and the ancient well as also the pump-set was covered with iron-mesh.

9. FORT ST. GEORGE MUSEUM, CHENNAI.—Gallery 10 of the museum was re-opened to the visitors after necessary renovation. The works of preparation of wooden show-case for flags, providing of vinatyle flooring of Gallery 5 and provision for boring pump-set for drinking water were taken up and completed.

10. GOVERNMENT MUSEUM, EGMORE, CHENNAI.— The museum collection was further enriched by acquiring eight bronzes and three stone sculptures. Notable among them include the images of Parsvanatha from Neikuppi, Subrahmanya and Vishnu from Chengalpattu, District Chengalpattu, one fragmentary image of Vishnu along with the images of Devi from Ponneri and Ganesa from Thiruvidadaimarthur, District Thanjavur.

11. MATTANCHERRY PALACE MUSEUM, COCHIN.—The work of providing adequate lighting facility to all the galleries and mural chambers was done along with preparation of show-cases for the display of coins. A wooden show-case was provided for displaying the replica of 'Kumarasambhava' panel. Wooden pedestals with sunmica veneering were provided for display of palanquins.

12. MAHARAJADHIRAJA LAKSHMISHWAR SINGH MUSEUM, DARBHANGA.— During the period under review, chemical treatment of the objects was taken up.

13. ARCHAEOLOGICAL MUSEUM, RED FORT, DELHI.—The damaged background cloth of the show cases was replaced.

14. INDIAN WAR MEMORIAL MUSEUM, RED FORT, DELHI.— The work of providing brass railing in the museum galleries was done along with installation of iron-gates for reserve collection and stores. The damaged glass panels of show-cases were replaced.

15. ARCHAEOLOGICAL MUSEUM, GWALIOR.— The work of preparation of wall show-cases for display of antiquities as also of cement pedestals in galleries and verandah for keeping the heavy sculptures was done along with construction of stone-masonry shelves for keeping antiquities in reserve collection. Masonry pedestal was constructed in front of Hospital and Jail building for placing sculptures.

16. ARCHAEOLOGICAL MUSEUM, HALEBID.—The work of providing false ceiling in the gallery was done along with arrangement for a publication sale counter. The pedestals in the open air gallery and reserve collection were repaired.

17. ARCHAEOLOGICAL MUSEUM, HAMPI.— The work of re-organization of gallery was done along with provision of pedestals for stone sculptures in the verandah. Running show-cases were prepared in Gallery 2 and 3.

18. SALAR JUNG MUSEUM, HYDERABAD.— The 107th birthday celebration of Salar Jung III was observed for a week from the 7 to the 13 April, 1993. A *Catalogue of Arabic Manuscripts*, Vol. VII, was released. Besides, a temporary exhibition (pl. XXXIVA) on 'Asian Ivory in Art' was inaugurated on the 7 April, 1993. The Salar Jung Memorial lectures on 'Architecture of Nawabs of Oudh' were delivered by M.C. Joshi on the 18 April, 1993. In addition to the above, special lectures on 'Museum as an Instrument of Education' by Radha Krishna Sarma (the 10 April, 1993); 'Salar Jung-III and His Times' by Hasnuddin Ahmed (the 12 April, 1993) and 'Rock-cut-Monuments of Western India' by S. Nagaraju (the 13 April, 1993) were also arranged at the museum premises.

Apart from the cultural programmes performed by the employees, best worker's award was presented to the museum staff. The Museum was specially kept open exclusively for the visit of disabled children on the 19 April, 1993 and two hundred forty-three disabled children belonging to various schools enjoyed seeing the art galleries of the museum.

The museum also celebrated the 'Children's week' from the 14 - 20 November, 1993 and on-the-spot competitions in essay writing, elocution and drawing were conducted. In all, seven hundred and fifty students from forty-three educational institutions participated in the competition.

In the course of the museum week, i.e., from the 8 to the 14 January, 1994 exhibition on 'Children's Art' highlighting the paintings and sketches drawn by physically and mentally handicapped children was organized. Rangoli competition exclusively for ladies was conducted on the 13 January, 1994. In all, eighty-six ladies of different age groups participated in the competition.

Besides, the museum organized a Seminar on the 'Concept, Policy and Planning of Museums in India' by N. Harinarayana (the 8 January, 1994); 'Site Museums—Their Concept, Policy and Planning' by I.K. Sarma (the 9 January, 1994); 'Important Site Museums of Andhra Pradesh, Concept, Policy and Planning' by Jitendra Das (the 10 January, 1994), D. Bhaskara Rao (the 11 January, 1994); 'Rare Manuscripts and Library of Salar Jungs' by Rahmat Ali Khan (the 11 January, 1994); 'Science Museums—Their Concept, Policy and Planning' by Saroj Ghose (the 12 January, 1994) and 'National Museums of India—Their Concept, Policy and Planning' by R.C. Sharma (the 13 January, 1994).

MUSEUMS

The 108th birthday of Salar Jung the III was also celebrated from the 27 March to the 2 April 1994 by arranging two Salar Jung Memorial lectures under the title 'Life and Times of Nizams and Salar Jungs' by Radha Krishna Sarma (the 28 March, 1994) and 'The Nizams's contributions to the Art and Culture of Andhra' by Acharya Tirumala Rama Chandra (the 29 March, 1994).

Besides, a two-day Seminar on 'The Salar Jung Museum— Its Cultural Context' (the 30-31 March, 1994) was arranged at the museum in which nine scholars participated.

A Mobile Exhibition on 'Monuments of Hyderabad' was also organized and seventy-two educational institutions and forty thousand four hundred seventy-three students availed of this facility.

The museum also arranged slides and film shows on art, culture and monuments in which three thousand five hundred twelve students from sixty-four educational institutions participated.

During the year, one thousand five hundred and thirty-four art objects and thirty-four miniature paintings were chemically treated by the conservation laboratory. Five oil paintings were also restored with the frames.

A rare and precious Quran Sharif (pl. XXXIVB), finely decorated with Persian translation by Qutb Shahi Calligrapher was presented to the museum by Anurag Sharma, Deputy Commissioner of Police, Hyderabad who recovered it from a search. This valuable manuscript with eight excellent miniatures belongs to Qutb Shahi period (seventeenth century AD).

The museum brought out a guide book on the Salar Jung Museum edited by M.L. Nigam in Hindi; *Catalogue of Persian Manuscript*, Volume X; and *Catalogue of Arabic Manuscript*, Volume VII, both compiled by Late Mohd. Ashraf.

19. GOVERNMENT MUSEUM, JHANSI.— The museum acquired twenty-five bronzes, three stone sculptures, six hundred ninety-two copper coins, four miniature paintings, three arms, two terracottas, one manuscript and twenty-two art objects.

20. ARCHAEOLOGICAL MUSEUM, KALIBANGAN.— The work of providing false ceiling in the gallery including track-light arrangement was made.

21. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.— To arrange the sculptures in a row, a 22 m long brick-masonry pedestal was constructed in the Jardine Museum. Pedestals for sculptures in different galleries were also prepared.

22. ARCHAEOLOGICAL MUSEUM, KONARAK.—The pedestals and show-cases were repaired and the lawns developed.

23. ARCHAEOLOGICAL MUSEUM, KONDAPUR.— A brochure on the museum was brought out.

24. GOVERNMENT MUSEUM, MATHURA.— During the year under review, the collection of the museum was further enriched by acquiring thirty-two stone sculptures, four gold coins, forty-five silver coins, twenty-six copper coins, one hundred forty-seven bullion coins, one silver medal, one prehistoric object, three bronzes, two copper-plates, three manuscripts, nineteen paintings, four textiles, six ivory

objects and twenty-one other objects. Among the sculptures, mention may be made of two standing Vishnu figures of buff sandstone (pi. XXXIVC) wearing a high conical diadem, earring and breast jewel. The images are four-armed with usual *ayudhas viz.*, mace in his upper right hand, the wheel in the upper left and conch-shell in his lower left hand.

25. ARCHAEOLOGICAL MUSEUM, NAGARJUNAKONDA.— The work of re-wiring was attended to and wooden partition in-between the store and the museum gallery was provided.

26. ARCHAEOLOGICAL MUSEUM, RATNAGIRI.— The excavated objects unearthed from Ratnagiri were chemically treated for display in the museum.

27. CENTRAL MUSEUM, NAGPUR.— One hundred sixty-eight copper coins were received from the Survey for display and eight hundred ninety-nine were chemically cleaned.

28. ARCHAEOLOGICAL MUSEUM, ROPAR.— The works of preparing wall and table show-cases, fixing of glass and providing of lighting arrangement were taken up.

29. ARCHAEOLOGICAL MUSEUM, SANCHI.— The work of display of Mauryan 'Lion Capital' after its chemical treatment and provision of track-lights in the main gallery were made along with re organization of main as well as other galleries in chronological order. Boring was done for supply of water for drinking and gardening purposes.

30. ARCHAEOLOGICAL MUSEUM, SARNATH.— The museum collection was further enriched with the addition of two votive temples depicting the figures of Surya and Ganesa, Vishnu and Surya respectively and a stone slab depicting a group of musicians and donors from the Patna Circle of the Survey. Those objects were unearthed during the excavation at Sarnath.

31. TIPU SULTAN MUSEUM, SRIRANGAPATNA.— The work of providing sunmica veneering to the existing show-cases was done along with the arrangement for a public sales counter. A brochure on the museum was also brought out.

32. BHARAT KALA BHAVAN, VARANASI.— The museum acquired two nut-crackers, one in brass and the other in iron along with a silver coin of Sultan of Gujarat.

VIII. ARCHITECTURAL SURVEY

TEMPLE SURVEY, NORTHERN REGION.—The Temple Survey Project, Bhopal, under B.L. Nagarch studied and surveyed the Sun temple at Chhatarpur, District Chhatarpur in Madhya Pradesh.

Standing on a spacious platform approachable by a double flight of steps on the north, the temple faces east and consists of a *pancharatha* sanctum, an *antarala* and a *mandapa* on plan. It is built partly of granite and partly of sandstone. Being co-eval in date with Matangesvara and Varaha temples at Khajuraho, it is assignable to early tenth century. The *mandapa* is provided with a niche composed of two rectangular pilasters on the northern and southern sides. The flat ceiling of the *mandapa* is supported by four pilasters and decorated with a full-blown lotus in the centre and with *kirtimukhas* on the corners. The sanctum doorway has five plain *sakhas*. The sanctum enshrines a beautiful image of two-armed Surya standing in *samapada* and having a circular halo behind his head. He is flanked on the right by Pingala and Asvini-kumara and on the left by Dandi and Asvini-kumara. In elevation the temple shows from bottom upwards *pitha* and *adhishtana* mouldings surmounted by *jangha* which is divided into two segments by a plain median band. The southern, western and northern *bhadras* of the temple show a niche each which is lying vacant at present. The *jangha*, surmounted by *varandika* mouldings which supported the *sikhara*, is now missing.

This temple of Surya is important in that it is the only one at Chhatarpur. It is earlier than Chitragupta temple at Khajuraho which too is dedicated to Surya and is assignable to the eleventh century.

Besides, the Jaina rock-cut sculptures and rock-cut temples inside the fort at Gwalior were also studied. Those were executed during the reign of Tomar rulers Dungarendra Singh and Kirti Singh in fifteenth-sixteenth centuries. The numerous Jaina inscriptions, engraved on these rock-cut sculptures and temples range in date from AD 1440 to 1529, furnish valuable information regarding the names of Jaina acharyas and the devotees.

BUILDING SURVEY.—H.N. Singh, assisted by Sudhir Kumar, Kewal Singh, K.K. Verma and Raju of the Building Survey Project of the Survey, carried out architectural survey of the fortress at Dev Hansagarh in tehsil Bari, District Dholpur, Rajasthan.

The fortress is situated in the village of Sone-ka-Gurja(26°27'N; 77°36'E) which, in its turn, lies 35 km from Dholpur and 19 km from Bari and is connected with the places by an all-weather metalled road. The ancient monument in fact lies 2 km off the road through a dusty and bumpy cart-track.

Dev Hansagarh raised on a hill top, consists of two conjoint fortified parts being aligned along the north-south axis. While both the parts are almost rectangular on plan, the northern one is smaller and the southern one is larger—both separated by a strong bipartite wall. The only entrance into the complex is through a gate provided in the centre of the western arm of the smaller enclosure. The elevation of the fortress is found largely compact and intact like the fortification walls of Gangoora and Ghan Teen Thekra, the *prakara* of Dev Hansagarh, too, appears to be free-built. Further, the *prakara* is found to be wider at the base but slender at the apex. It is built of locally available red and buff sandstones. The constructional makeup of the *prakara* is reflecting coursed masonry work of dressed-stones laid neatly in lime-mortar. In elevation the *prakara* is too high to be scaled by human beings. The wall-surface is not covered with plaster. Besides battlement, as a measure of defensive device, *prakara* is also constructionally provided with loopholes or arrow-slits (*tirakash*) at varying levels and distances. Unlike the wall structure, battlement is seen covered with a thick coating of lime-plaster. There is a wide walk-way over the top of the *prakara*, which is approachable through collaterally placed and projected stair-cases. The walk-way along the southern *prakara* is found to be 0600 m in width, excluding thickness of the wall of the battlement, which is further found to be approximately 01 00 m in width. A couple of superbly built structural bastions (pl. XXXV A) in stones are seen dominating the rear, front and side elevations of the fortress. In all, the fortress is endowed with as many as eleven sturdily built bastions, of which six bastions are roundish and the remaining five *attalakas* are rectangular (fig. 30). The latter ones are conspicuously higher in elevation than the roundish bastions. The fortress of Dev Hansagarh is single gateway (*eka-mukha-durga*), which is facing west. Its front elevation is betraying overwhelming similarities with the gateways of Bari's *Sarkari-Qila* and *Pathan-Qila*, which are situated in the neighbourhood of Dev Hansagarh. The natural ground surface formation reflects the passage through the gateway. The alignment of this passage is straight, not winding. While the front elevation does not reveal the structural formations of floor-levels, but, in the interior the gateway-complex is carrying two storeys on either side along its straight passage. The arched-entrance way (*simha-dvara*) is devoid of plaster and contemporary door-leaves are found missing. The high rising roof of the gateway is seen covered with large-sized stone-slabs. The gateway (*gopura : simha-dvara*) and the appurtenant fort-wall is also carrying series of loopholes. Outside, the gateway complex is flanked on either side by two roundish *attalakas*. The southern segment of the fortress, too, is provided with an imposing gateway, which, however, is facing north (pl. XXXV B). In comparison to the main-gate (*simha-dvara*), the inner gate is much more majestic in height and larger in overall dimension. Its stone-slab paved entrance-passage is slightly raised. The gateway is seen secured by a pair of door-leaves, which are still fairly intact *in situ*. While its facade is betraying only two (upper) storeys, the lower two floor-levels or storeys can be noticed on either flank of the doorway passage. In other words, it may be stated that the inner gateway-complex is four-storeyed. Further, while the gateway arch is plain, the arched-openings on the third and fourth storeys are cuspidal. Like the main-gate (*simha-dvara*), this (inner) gateway, too, is provided with arrow-slits (*tirakash*) at different levels (pl. XXXV B). The exterior wall surface is also seen suitably covered with stone eaves placed over stone-brackets. The ceilings of all the storeys including the gateway are found to be flat and constructed with large-sized flattish roof-slabs and beams of stones. As for the incidence of buildings and structures within the

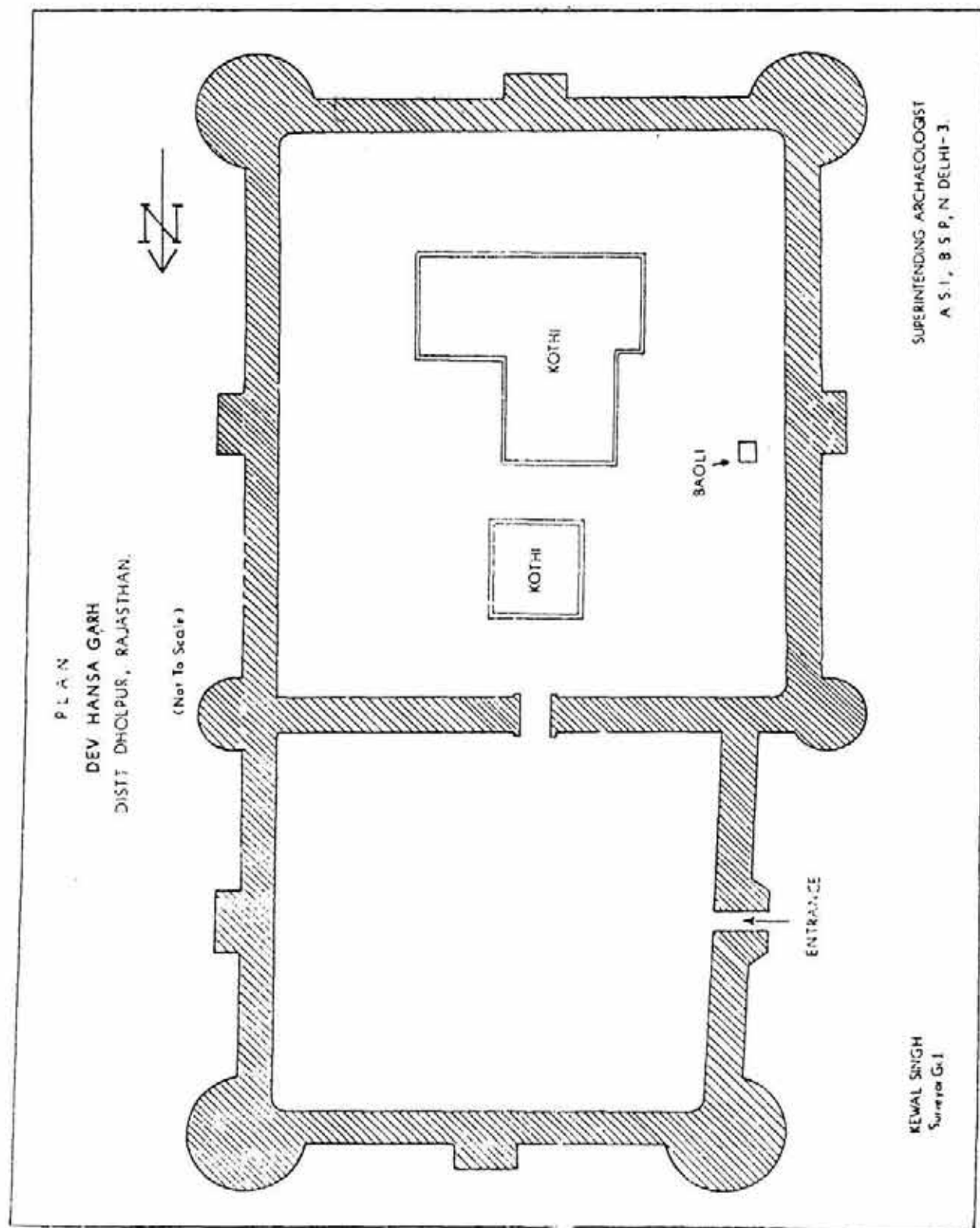


Fig. 30

fortress (fig. 30) is concerned it is observed that the northern (smaller) segment is largely vacant with an open courtyard, which appear to have functioned, as an open-air Diwan-i-Am - for in the eastern arm of the fort-wall and abutting the rectangular high-rising *attalaka* a couple of modest-sized cloisters (*baithak*) in successive tiers are seen deftly constructed in stones with a view to enable the *Raja* to sit and hold his royal *darbar*. The royal residential buildings (*Raja-Bhavan/Rihayashi-Kothi*), however, were situated in the southern segment. It is noticed that inside the southern segment, there is a nucleated cluster of *Bhavans* (buildings), which are single, double-and triple-storeyed. Facing north, the double-storeyed *bhavan* or *kothi* is situated in front of and much nearer to the inner gate. This building (*kothi*) probably appears to signify the royal -house for the males (*Raja-Mahal*). To the south of the *Raja-Mahal*, there is a bunch of interconnected three units of a sprawling house, which seems to denote the *Ranivas* (pl. XXXVI) or *Rani-Mahal* (royal female apartment). Of this, each unit is containing a courtyard in the centre. Beginning from the west, while the first and the second units are single storeyed, the third and the last unit, however, is three-storeyed. The entire complex of *Raja-Mahal* and *Rani-Mahal* (pl. XXXVI) is constructed in stone with mud-mortar and lime-mortar. However, the entire *Raja-Bhavan* complex is in a much dilapidated condition. Situated spatially in-between the *Shahi-Rihayashi-Kothi* (royal residential buildings) and the western fort-wall, there is a crudely created well (*baoli*), which has been arduously scooped out of hard bed-rock.

There are a couple of buildings and constructions located outside but close to the fortress, which, too, merit mention, for they are irrevocably cognate to the life and time of Dev Hansagarh. In this connection it may be stated that juxtaposed to the west of this sturdy fortress, there is a sprawling walled complex containing around a centrally situated vacant space an array of group of rooms and *dalans* (verandahs). It is distinguished by an impressive gateway (now in ruins), which is facing east, i.e., towards the fortress of Dev Hansagarh. Considering the layout and the form of its construction, it is surmised that probably this sprawling complex represents the royal abode (*shahi-wada*) of the Prime Minister and/or other high ranking dignitaries of the contemporary kingdom. It may further be mentioned that just to the west of *shahi-wada*, a valley-like natural cleavage is existing, which is pretty deep and fairly wide (reservoir: *jalasaya*). With a view to impound the rain water, a very high and wide dam-wall in stone-masonry is seen constructed across the deep and wide basin of the valley. The skillful erection of the stone-masonry dam-wall has longitudinally bifurcated the valley in two parts, i.e., lower and upper. It may not be unreasonable to observe that this kind of dam formation (reservoir: *jalasaya*) was consciously caused to be constructed by the founders of Dev Hansagarh with a view to fulfil the requirement of water, besides indulging in wild games.

As regards dating, an inscription on a stone-slab in the western fortification wall of the southern segment throw s ample light on the history of the fortress. This inscription in Devanagari script is in local Hindi dialect which reads as under:-

1. *si dhi sri su va ju deva ham*
2. *sa pha te van ga va ha du ra janai*
3. *ga dha vana va yau rasa la da*

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4. *ra ra mancha da ki ka ma da ri*

5. *ka ri ga ra ra ma than dra mi vi*

6. *je tha va di 9 sam va tu 1914*

According to this inscription, the fortress of Dev Hansagarh could be said to have been built in *samvat* 1914 (AD 1857) by Sri Suva Ju Dev Hansa Fate Jung Vahadur. Further, the fort is claimed to have been constructed by (mason : *karigar*) Ramachandra. The name of the architect (*kamadari*) is Rasaladar Ramachand. It is said that Suva Dev Hansa had fought doggedly from this fortress against the British rulers during India's Freedom Struggle in AD 1857. Finally, it is stated that the fortress of Dev Hansagarh now stands deserted and unoccupied.

The Building Survey Project of the Directorate of Archaeology, Government of Gujarat, in continuation of the last year's work, noticed a total number of fifty-two buildings with wood-carvings in District Ahmedabad.

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

Agra Circle

UTTAR PRADESH

1. AGRA FORT, AGRA, DISTRICT AGRA.— The pathway in front of Jahangiri Mahal (pl. XXXVII) was paved with the well-dressed red sandstone slabs including the entrance porch or *deodhi-darwaja* of the monument. The wall-veneering and the structure of white marble in front of Diwan-i-Khas towards the dry moat were repaired by way of stained pointing. The fallen walls and pillars of the cells around the courtyard of Mina Bazar were restored by *lakhauri* brick-work.

2. JAMA MASJID, AGRA, DISTRICT AGRA.—The restoration of the southeastern minar was attended to in continuation of previous year's work. The work of providing first class brick-tile core and R.C.C. junction slab beams and red sandstone *gala dab* and veneering stones was attended to.

3. TAJ MAHAL, AGRA, DISTRICT AGRA.— The works of patch-plastering, pointing and restoration of inlay of the mosque were taken up. The rusted iron dowels of red sandstone veneering of the interior of the mosque were taken out and reset in stones in proper position. The decayed ones were also replaced by new stones.

The restoration work of decayed red sandstone *jali*-railing towards the south of the main building was continued and is still in progress.

The decayed and weathered red sandstone floral and geometrical panels of the veneering of the main gate at the southeastern corner *burj* were also replaced with new ones as per the original. The restoration of inlay (pl.-XXXVIII) was also attended to. The flooring of the western and the southern side rooms of Glass House Nursery were also plastered, underpinned and concreted. The walls and ceilings of the southern side rooms of the eastern courtyard popularly known as *gaushala* were repaired by underpinning. The collapsed *chhajja* and the supporting bracket stones of the room on the right side entrance gate were provided after finishing the stones and the damaged ones were replaced. The walls of the room were repaired. The restoration of the decayed red sandstone flooring of the main gate was taken up and is still in progress. The gate of the Khan-i-Alam Bagh was repaired by underpinning and pointing. The collapsed compound wall near the western door of Khan-i-Alam was restored.

The copper lightning conductors were provided to the main mausoleum and to the minars of the northeastern and northwestern corners. A shed of transparent sheet was provided over the metal-detector entrance on both the sides.

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4. TOMB OF SADIQ KHAN AND SALAWAT KHAN, AGRA, DISTRICT AGRA.—Repairs to the monuments were attended to by underpinning, plastering and providing flagstone flooring, etc.

5. HUMAUN MASJID, KACHHPURA, DISTRICT AGRA.— Red sandstone flooring was provided to the northern side of the monument. A fallen wall and the pillars were restored by *lakhauri* brick-masonry and stone-veneering on the exposed sides.

6. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.— The northern side causeway was restored by providing red sandstone flooring and *dasa* stones over lime-cement concrete base. The tank on the western side causeway was repaired by stained pointing and plastering. The main tomb was repaired by providing the missing/fallen veneering stones and inlay pieces to the arches of *dargah* as per the original. The compound wall of the monument was repaired by underpinning with random rubble masonry and recessed pointing.

7. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.— The missing and decayed red sandstone *chhajjas*, brackets, door-frame and veneering of the *baradari* near Khush Mahal were replaced by new ones and the joints of veneering and *chhajjas* were pointed.

The restoration of platform on the three sides of the tank located towards the north of Diwan-i-Khas was carried out by providing the *pandar dasa* and veneering, all fashioned out of red sandstone and by plastering with lime-mortar.

The Hammam located towards east of the tank was repaired by plastering. In the *dalan* towards the northern side of the Diwan-i-Khas was repaired by providing red sandstone brackets, *chhajjas* and veneering. Besides, flooring was done by laying red sandstone slabs.

8. GROUP OF TEMPLES, DANDESVAR, KOTLICUNTH, DISTRICT ALMORA.—The dilapidated boundary - and retaining-walls were restored with coursed rubble-masonry, over which a 50 cm high iron-grill painted with matching colour was provided to check the entry of cattle, etc. The masonry joints were pointed after thoroughly raking out the loose mortar. An iron-gate was provided for safety and security of the monument.

9. LAKSHMI-NARAYANA TEMPLE, TALLIHAT, DISTRICT ALMORA.—The temple compound was partly paved with flag-stones. The unpaved area was attended to for flag-stone flooring and completed. The boundary-wall which was irregular in height was brought to a uniform height by adding stone-masonry. An iron-grill gate was provided over it to raise the height of the boundary-wall without obstructing the temple view. An iron-grill gate was also provided to the entrance of the temple.

10. RAKSHASI DEVAL, TALLIHAT (NEAR BAIJNATH), DISTRICT ALMORA.— In order to check percolation of rain water one metre wide flag-stone apron was laid over a base concrete all around the temple. One metre high boundary-wall was raised with stone-masonry over which iron-grill of 50 cm height was provided.

11. ANCIENT SITE, SANKISSA, DISTRICT FARRUKHABAD.— The environmental development of the site by planting trees, flowering plants and hedges was taken up. The work is still in progress.

Aurangabad Circle

MAHARASHTRA

12. FORT, HARISCHANDRAGAD, DISTRICT AHMEDNAGAR.—The small shrine in front of the main temple was repaired by reconstructing the roof with available stones. The missing portion of the compound-wall on the three sides of the main temple was reconstructed in stone-masonry as per the original. Both the *sikharas* on either side of the main temple were watertightened.

13. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— The work of widening of steps from foot of the hill to the entrance was completed. The flight of steps were provided with proper size and tread with landing at convenient places and masonry parapet on either side. The retaining-wall (pl. XXXIX) of the pathways near Cave 16 fallen due to erosion of soil was reconstructed in stone-masonry and rock appearance was given to it from outside. The parapet above the wall was also reconstructed for safety of the visitors. The work of construction of staff quarters at Fardapur is in progress.

14. TOMB OF RABIA DAURANI (BIBI-KA-MAQBARA), AURANGABAD, DISTRICT AURANGABAD.— Decayed plaster from the main tomb and compound-wall was removed and replastered as per the original in lime mortar. The work of laying tar road from Bibi-ka-Maqbara to the Circle office and staff quarters was completed.

15. DAULATABAD FORT AND MONUMENTS, DAULATABAD, DISTRICT AURANGABAD.— The construction of parapet along side of the steps from Ganesha mandir to *baradari* is in progress.

16. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.— The work of providing barbed wire fencing along the road from Cave 1 to Cave 16 and chain-link fencing along either side of the road leading to Cave 16 is in progress.

17. GRISHNESHVAR TEMPLE, VERUL (ELLORA), DISTRICT AURANGABAD.— Plastering of dome of the *chhatra* in front of the main temple is in progress.

18. UKKADESHVAR TEMPLE, UKKADPIMPRI, DISTRICT BEED.— Watertightening of the Ukkadeshvar Mahadeo temple was completed.

19. FORT-WALL AND GATE, PAONI, DISTRICT BHANDARA.—The reconstruction of the fallen portion of the corner of the main gate of the Paoni fort was completed. The fallen arched portion was also restored. The plastering of the outer and inner walls of the gate was also completed in combination mortar.

The reconstruction of the damaged portion of the fort-wall was completed and top of the wall was concreted as per the original.

20. MAHAKALI TEMPLE, CHANDRAPUR, DISTRICT CHANDRAPUR.— Repair to the *sikhara* of the temple including applying suitable white wash was completed.

21. CHANGDEO TEMPLE, CHANGDEO, DISTRICT JALGAON.—The reconstruction of the southern wall of the temple is in progress.

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22. GONDESHVAR TEMPLE, SINNAR, DISTRICT NASIK.— The work of providing lightning conductor on *sikhara* of the temple is in progress.

23. ELEPHANTA CAVES, ELEPHANTA ISLAND, DISTRICT RAIGAD.— The work of reconstruction of fallen retaining-wall in front of Cave 2 is in progress.

24. KUDA CAVES, KUDA, DISTRICT RATNAGIRI.—Removal of vegetation was carried out in front of the cave and in the surrounding area.

25. JANJIRA FORT, MURUD, DISTRICT RATNAGIRI.— Extensive jungle clearance was carried out inside the fort.

26. CAVES, PANHALEKAZI, DISTRICT RATNAGIRI.— Reconstruction of the damaged wall along the bank of the river has been completed. Masonry wall was constructed along the bank of the river Kotjai so as to protect the river water entering into the caves. Caves were provided with wooden doors.

27. FORT, SHOLAPUR, DISTRICT SHOLAPUR.—Out-of-plumb western wall of the Padmavati tower was dismantled and reconstructed with available stones as well as new ones. Steps of the Padmavati well were also repaired. The second gate of the eastern wall was watertightened.

28. SINDHUDURG FORT, MALVAN, DISTRICT SINDHUDURG.—Extensive clearance of vegetation was carried out from the fort-wall as well as ancient structures inside. The work of underpinning the eroded stone jetty due to sea waves was completed.

29. SIVA TEMPLE, AMBERNATH, DISTRICT THANE.— The decayed slab of the sanctum of the temple was removed and replaced by a new one.

Bangalore Circle

KARNATAKA

30. FORT, DEVANAHALLI, DISTRICT BANGALORE.—The collapsed wall and bastion on the northern side was cleared of debris and reconstructed as per the original plan and elevation utilizing the available granite blocks. The core was filled with alternate layers of *murrain* and boulders. The joints were recess-pointed with combination mortar.

31. KAMALA BASTI, BELGAUM, DISTRICT BELGAUM.— The sunken and out-of-plumb ornate *mukha-mandapa* of unique plan and *vitana* decoration was carefully dismantled and is being restored by mending the broken capitals and beams

32. ANANTASAYANA TEMPLE, ANANTASAYANA GUDI, DISTRICT BELLARY.— The damaged portions of the brick-and-mortar *gopura* were mended and repaired suitably. The roof of the Lakshmi shrine was rendered watertight by providing a layer of brick-jelly concrete of suitable thickness.

The archaeological area around the temple was fenced by using 'L' angles and barbed wire.

33. HAZARA RAMACHANDRA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—The fallen and cracked merlons of the northern wall of the *prakara* were repositioned at their respective places. The eastern boundary of the archaeological area was provided with a dwarf wall of required height and length in cut-stone masonry to provide fencing of chain-link mesh.

34. QUEEN'S BATH, KAMALAPURAM, DISTRICT BELLARY.— The work of removing the decayed, dead lime-concrete flooring for providing fresh flooring is in progress.

35. PATTABHIRAMA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.— New floor slabs were provided in the *maha-mandapa* (pl. XL) for the missing ones. The sunken flooring was relaid after due levelling. Two of the cracked stone beams and capitals in the *maha-mandapa* were suitably mended by using non-corrosive stainless steel rods of required size with fevitate. The modern masonry supports were removed.

36. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY.— The out-of-plumb cloister *mandapa* (pl. XLI) on the western side of the temple was dismantled along with the masonry buttresses and parapet and reconstructed to plumb after due strengthening of the foundation and mending the broken beams. The roof slabs were replaced and suitably watertightened by using brick-jelly with lime combination mortar.

37. GOPALA KRISHNA TEMPLE, TIMMALAPURAM, DISTRICT BELLARY.— The dislodged and out-of-plumb cloister *mandapa* on the northern side of the temple was dismantled and reconstructed as per the original after suitably strengthening the foundation, mending the broken and cracked beams and pillars by using non-corrosive stainless steel rods with fevitate.

38. VITTHALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.— The exfoliated, cracked and damaged veneering members on the eastern side of the *antarala* were dismantled and reconstructed as per the original after mending the less damaged members or by replacing the decayed ones as per necessity (pl. XLII). Four new stone pillars which were provided earlier to support the roof of the *navaranga* were replaced by the original members after mending them duly by using non-corrosive stainless steel rods of requisite thickness with fevitate. The sunken and damaged flooring of the *antarala* and *navaranga* were removed and relaid after levelling the area and providing it with sand cushion.

39. DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—The pavement in front of the entrance *mandapa* was relaid. Curb stones were fixed around the pavement of Durga temple while the floor of the *mandapa* was properly pointed, its roof was rendered watertight with M-seal pointing after raking out the old dead pointing. The main entrance to the temple was provided with a suitable painted wooden door to ward off entry of the bats. Fencing work along with provision of a grill-gate was completed. The fallen dry masonry fort-wall was constructed afresh.

40. GAUDARA GUDI, AIHOLE, DISTRICT BIJAPUR.— The work of providing compound-wall was completed.

41. HUCHCHAPPAYYA MATHA, AIHOLE, DISTRICT BIJAPUR.—Construction of dwarf wall and earth work for laying foundation for a compound-wall and provision of steps at the entrance were completed.

42. MEGUTI TEMPLE, AIHOLE, DISTRICT BIJAPUR.—ROWS of fresh steps were provided to the temple.

43. RAVALPHADI CAVES, AIHOLE, DISTRICT BIJAPUR.—The area in front of the cave was fenced.

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44. OLD SIVA SHRINE NEAR ANANTASAYANA TEMPLE, BADAMI, DISTRICT BIJAPUR.— The disturbed and sunken flooring was relaid after retrieving the members from the tank and laying a boulder-sand cushion.

45. ARQUILLA, BIJAPUR, DISTRICT BIJAPUR.— The buried structure was exposed and the area was levelled.

46. GALAGANATHA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— Broken beams of the circumambulatory passage were mended and consolidation of the foundation of the plinth of the temple was completed.

47. SANGEET AND NARI MAHALS, TORVI, DISTRICT BIJAPUR.— The top surface of the wall of Nari Mahal was rendered watertight by providing brick-jelly concrete in lime-mortar.

48. AMRUTESVARA TEMPLE, AMRUTAPURA, DISTRICT CHICKMAGALUR.— The decayed and dead lime-*surkhi* terracing over the roof was completely removed and relaid with fresh brick-jelly concrete. The joints of the *sikhara* and the roof of the attic were watertightened by using araldite and suitable hardner. The disturbed out-of-plumb *prakara* on the north side was dismantled and the work of reconstruction by using available stone blocks is in progress.

49. MURUGHA RAJENDRA MATHA, CHITRADURGA, DISTRICT CHITRADURGA.— The entire roof of the *matha* was rendered watertight with brick-jelly and lime-mortar after raking out the weathered dead concrete (pl. XLIII).

50. JAINA TEMPLES, MALLUR, DISTRICT COORG.— Stone masonry compound was concreted to a requisite height along the periphery of the archaeological premises around the temples to prevent misuse of the land and entry of the cattle.

51. CHAUTER PALACE, MOOBBIDRI, DISTRICT DAKSHINA KANNADA.— Old and dislodged portion of the north-west corner wall of the palace was consolidated after strengthening the foundation. The walls were plastered with 'neru' finish. The wooden pillars and false wooden ceiling were repolished with soligra polish after scraping out the discoloured old polish.

52. GOMATESVARA STATUE, KARKALA, DISTRICT DAKSHINA KANNADA.—The disturbed low laterite wall around the inner courtyard of the statue was carefully dismantled and reconstructed as per the original. The roof of entrance *mandapa* was rendered watertight by removing the dead concrete and relaying it with brick-jelly lime-concrete. Hand railing in G.I. Pipe was provided to help the visitors for climbing the steps.

53. JAMALABAD FORT, NADA AND LAILA, DISTRICT DAKSHINA KANNADA.— Masonry steps were provided on the slope of the hill and the fortification. Steps were rendered free from rank vegetation.

54. NANNESVARA TEMPLE, LAKKUNDI, DISTRICT DHARWAD.— Construction of a stone masonry compound of requisite height along the periphery of the temple is being done to prevent entry of the cattle and misuse of the archaeological area.

55. TARAKESVARA TEMPLE, HANAGAL, DISTRICT DHARWAD.— The precariously hanging electric fittings were removed and concealed.

56. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— The broken beams, roof slabs and the out-of-plumb upper register of the wall along with the *kapota* of the northern entrance of the temple were carefully dismantled by cutting the brick-jelly concrete roof. The broken beam was strengthened by using concealed stainless steel T section girder of required size. The much damaged and missing roof slabs were replaced with fresh ones. The masonry construction supporting the *kapota* was dismantled and the corresponding carved architectural members which were housed in the reserve collection of the Archaeological Museum, Halebid, were identified and placed in their original position. The masonry supports provided later on the inner side in the *mukha-mandapa* were removed and an ornate niche built into the west wall was laid bare.

57. LAKSHMI-NARASIMHA TEMPLE, NUGGEHALLI, DISTRICT HASSAN.— The dead concrete from the wall of the *pakasala (madappalli)* was completely raked out and a fresh waterproof course of requisite thickness was laid after replacing the damaged and missing roof slabs to prevent leakage of rain water. The wooden doors and windows were repaired.

58. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.— As an additional measure, a wire-mesh frame was provided to the skylights over the roof of the temple and a collapsible iron-gate was fixed at the door leading to the terrace. The joints of the stone pavements in the temple were cleared of vegetation and recess-pointed in combination mortar.

59. KESAVA TEMPLE, SOMANATHAPURA, DISTRICT MYSORE.— In continuation of the previous year's work (1992-93, p. 153), the archaeological premises around the temple was fenced by using 'L' angles and barbed wire over a stone masonry dwarf wall of requisite height.

60. KIRTINARAYANA TEMPLE, TALAKAD, DISTRICT MYSORE.— The process of removing heavy accumulation of sand around the temple and the *mahadvara* is in progress.

61. VAIDYESVARA TEMPLE, TALAKAD, DISTRICT MYSORE.— To arrest rain-water stagnation within the courtyard of the temple, size-stone masonry drain was provided on the eastern side with proper gradient and flagstone pavement was laid around the *diksha-mandapa* and at the western side of the temple. The unevenly sunken and damaged flagstones near the entrance door were relaid after due levelling. The dislodged balustraded flight of steps provided to the sub-shrines in the complex were dismantled and reconstructed to plumb as per the original, besides constructing cut stone-masonry pedestals for the loose sculptures scattered in the temple premises. The dead plaster over the roof was raked out and redone in combination mortar mixed with suitable colouring agent to match the original. The brick-built *vimana* of the temple was provided with a colour wash of waterproof cement to match the original after attending to minor repairs.

62. KEDARESVARA TEMPLE, NAGALAPURA, DISTRICT TUMKUR.— The archaeological area around the temple was cleared of the accumulated debris and levelled. Retaining-wall at requisite height was constructed of cut-stone-masonry. Fencing work using 'L'angle iron posts and barbed wire is in progress.

63. JATTAPPA NAYAKA CHANDRANATHA BASTI, BHATKAL, DISTRICT UTTARA KANNADA.— The out-of-plumb, four-pillared *mandapa* was carefully dismantled. The vertical cracks of the pillars were suitably mended with the help of iron and steel dowels and rebuilt as per the original after strengthening

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the foundation with R.C.C. The broken schist stone beams and slabs of the roof of the *navaranga* were carefully dismantled after removing the dead cement-concrete of the roof and new schist stone-beams, capitals and roof slabs were provided and rendered watertight by a waterproof course of brick-bats and lime-mortar after grouting the roof joints with suitable cement combination mortar.

64. MADHUKESVARA TEMPLE, BANAVASI, UTTARA KANNADA.— Broken *chhajja* of the northern entrance to the temple was dismantled and mended with stainless steel rods and refixed in its original position. Worn-out floor of the northern entrance passage was dressed by proper chiselling and new schist stone floor was provided wherever missing. The joints were suitably pointed. The old, decayed concrete floor of the shrine where sculptured stone cot is placed was carefully raked out and relaid with fresh flooring. The collapsed laterite wall of the northern entrance was reconstructed as per the original.

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MADHYA PRADESH

65. KAMLAPATI PALACE, BHOPAL, DISTRICT BHOPAL.— In continuation of the last year's work (1992-93, p. 154), the decayed and damaged wooden beams and ceilings of ground floor were replaced with fresh *sal* wood beams.

66. CHATURBHUJ TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.— Replacement of the worn-out and damaged G.I. barbed wire fencing with one metre high M.S. grill railing over an extended area for security of valuable sculptures of the temple and to check the trespass besides further development of the area is in progress.

67. CHITRAGUPTA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.— In continuation of the last year's work (1992-93, p. 154), concreting of approach road leading to Chitragupta temple remained in progress. Replacement of the old worn-out M.S. grill railing remained in progress. Repair to the flood lights at the western group of temples is in progress.

68. EXCAVATED SITE, KHAJURAHO, DISTRICT CHHATARPUR.— The area of the excavated site is being secured with G.I. barbed wire fencing on angle iron posts.

69. HANUMAN TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.— The old worn-out and damaged G.I. barbed wire fencing on angle iron posts has been replaced with 1.00 metre high C.R. masonry dwarf wall mounted with 1.00 metre high M.S. grill railing for the security of the sculptures and development of the area.

70. BUDDHIST CAVES, BAGH, DISTRICT DHAR.— In continuation of the last year's work (1992-93, p. 154), the construction of R.C.C. pillars in place of the twenty-six missing rock-cut ones in Cave 7 has been completed. Construction of R.C.C. beams and slab in place of the missing ones in Cave 7 remained in progress. Underpinning of the walls and cells of Cave 7 for strengthening them remained in progress.

71. ASHARFI MAHAL, MANDU, DISTRICT DHAR.— Restoration of damaged and missing compound wall in R.R. masonry laid in lime-mortar mounted with 1 00 metre high M.S. grill railing for the security of the monument, development of area and to check the encroachment has been completed.

72. CHAMPA BAOLI, MANDU, DISTRICT DHAR.— Bricks of original size have been procured for the repairs to brick-dome in the complex of Champa *baoli*. Excavation of dumped *malba* due to fallen portions of the underground cells of the Champa *baoli* and throwing the same away from the monument by head-load remained in progress.

73. DARYA KHAN'S MOSQUE, MANDU, DISTRICT DHAR.— The decayed, damaged and sunken plinth has been reset to the original position. The damaged and bulged wall arches and domes have been reset in R.R. stone masonry in lime-mortar.

74. GADA SHAH PALACE, MANDU, DISTRICT DHAR.— In continuation of the last year's work (1992-93, p. 154), the damaged, bulged and out-of-plumb buttress wall on road side has been restored in position in R.R. masonry and lime-mortar. The work has been completed.

75. HOSHANGSHAH TOMB, MANDU, DISTRICT DHAR.— The dilapidated compound was replaced with R.R. masonry dwarf wall in lime-mortar mounted with a metre high M.S. grill on the south of Hoshang Shah tomb near the bus stand to enclose the protected area for development and to prevent the encroachments.

76. JAHAZ MAHAL, MANDU, DISTRICT DHAR.— The damaged and missing limestone *chhajja* stones of the ground floor were being replaced with new ones quarried departmentally from Zeerabad quarry. The work remained in progress.

77. SHAHZADI-KA-RAUZA, CHANDERI, DISTRICT GUNA.— In continuation of the last year's work (1992-93, p. 155), the enclosure wall was extended and mounted with G.I. barbed wire fencing on angle iron posts. Flagstone flooring of the extended area was also completed. Restoration of damaged and missing brackets and *chhajjas* with fresh ones is in progress.

78. GROUP OF TEMPLES, KADWAHA, DISTRICT GUNA.— In continuation of the last year's work (1992-93, p. 155), the construction of stone-masonry compound-wall was resumed to enclose the Talab group of temples for the security of the temple. The work was completed.

79. FORT, GWALIOR, DISTRICT GWALIOR.— The pedestrian approach leading to the fort from the Gwalior gate between the Chaturbhuj temple and the Hathipol gate was repaired with stone-pitching laid on cement-concrete base.

80. HOSPITAL AND JAIL BUILDINGS, FORT, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), the restoration of rear fort-wall in stone-masonry was completed for the safety of the museum. Closing of the open arches of the corridors of Hospital and Jail buildings with 25 mm X 25 mm welded wire-mesh fixed into angle iron frame remained in progress.

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81. EK PATHAR-KI-BAOLI, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), restoration of damaged and missing pillars, brackets and lintels of Caves 10 and 11 with freshly prepared ones remained in progress.

82. URWAI GATE, FORT, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), the stone pitching on cement concrete base in the foreground of Jaina caves to check soil erosion and improve the frontage remained in progress.

83. MANSINGH PALACE, FORT, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), the patch repairs to walls and floors of the underground cells were done. The arch opening of the stairway leading to the underground cell was provided with M.S. collapsible shutter to check unauthorised entry.

84. SAS-BAHU TEMPLE, FORT, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), the damaged central flight of steps leading to Bahu temple platform was restored. The missing stone railing of the Bahu temple platform was also restored. The work was completed.

85. TOMB OF MOHAMMAD GHAS and TANSEN, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work (1992-93, p. 155), the maintenance of lawns and flower plants remained in progress.

86. PANDAV CAVES, PACHMARHI, DISTRICT HOSHANGABAD.— In continuation of the previous work (1992-93, p. 155), the letters written on the walls of the caves were chemically cleaned under the guidance of Chemistry Branch, Indore. M.S. door-shutters with wire-mesh were provided and fixed in the openings of the caves. The damaged flight of steps leading to the caves was repaired. G.I. pipe railing was also provided alongside the steps.

87. GATEWAY, FORT, ASIRGARH, DISTRICT KHANDWA.—The debris of the fallen bastion of the fort wall adjoining the entrance gateway was removed after sorting out useful stone and stacking them properly for reuse. The work is in progress.

88. OLD FORT, BURHANPUR, DISTRICT KHANDWA.— In continuation of the last year's work (1992-93, p. 155), the restoration of damaged walls was undertaken by underpinning the cavities with matching R.R. masonry and brick-masonry with matching special sized bricks laid in lime-mortar for improvement of the frontage of the old fort. Excavation of dumped debris of the fallen portion of the foil wall and bastion was removed. The latter was restored with R.R. and brick-masonry laid in lime mortar. The excavation in the central platform in order to find out ancient water tanks and channels remained in progress.

89. BUDDHIST ROCK-CUT TEMPLE AND CAVES, DHAMNAR, DISTRICT MANDSAUR.— In continuation of the last year's work (1992-93, p. 156), the damaged and decayed concrete of the terrace of caves was removed and relaid with fresh lime-concrete to prevent seepage of rain-water.

90. KAKANMATH TEMPLE, SUHANIA, DISTRICT MORENA.— In continuation of the last year's work (1992-93, p. 156), dismantling of the damaged and bulged *lower jagati* on the south side and restoration of the same as close to the original remained in progress (pls. XLIV-XLV).

91. ROCK-SHELTERS, BHIMBETKA, DISTRICT RAISEN.— In continuation of the last year's work (1992-93, p. 156), the numbers given on rock-shelters by the different agencies who worked at Bhimbetka were removed and small signboards inscribed with numbers were fixed at respective caves. Cavities of rock-shelters were also sealed to prevent seepage of water.

92. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.— In continuation of the last year's work (1992-93, p. 156), restoration of facade on the north-east corner of the temple with finely chiselled dressed sandstones and filling the back with R.R. block masonry laid in lime-cement-mortar remained in progress.

93. GROUP OF MONUMENTS, SANCHI, DISTRICT RAISEN.— In continuation of the last year's work (1992-93, p. 156), the bulged and damaged retaining-wall of the upper terrace adjoining Temple 31 was restored as per original. The missing retaining-wall on the north of the terrace was also restored in order to retain the earth of the upper terrace.

94. GROUP OF MONUMENTS, SATDHARA, DISTRICT RAISEN.— In continuation of the last year's work (1992-93, p. 156), the debris of fallen portion accumulated along the retaining-walls of the platform of Stupa 1 and Stupa 8 were cleared to know the extent and depth. Uprooting of the vegetation over the monument and in the vicinity of the remains remained in progress. Maintenance of *murrain* spread over the approach road leading to Satdhara site and the pathways connected to other monuments also remained in progress.

95. BUDDHIST STUPAS, BERHAT, DISTRICT REWA.— In continuation of the last year's work (1992-93, p. 156), restoration of damaged and bulged-out stone stupas was completed.

96. ANCIENT SITE, ERAN, DISTRICT SAGAR.— Replacement of old and damaged G.I. barbed wire fencing with C.R. masonry dwarf wall mounted with one-meter high M.S. grill railing was completed.

97. FORT, GAURJHAMAR, DISTRICT SAGAR.— Removal of debris of fallen portion and procurement of material for restoration work of fort remained in progress.

98. BARADARI, FORT, KHIMLASA, DISTRICT SAGAR. — In continuation of the last year's work (1992-93, p. 157), debris clearance of the fallen portions of the *baradari* was undertaken and restoration of walls with matching stone-masonry in lime-mortar was completed. Restoration of damaged and missing roof-slab with fresh one laid in lime-concrete was also completed.

99. FORT, RAHATGARH, DISTRICT SAGAR.— In continuation of the last year's work (1992-93, p. 157), the restoration of roof of Sai-ka-Mahal was undertaken by replacing the damaged and missing wooden beams and stone-slabs with similar fresh members laid in lime-concrete remained in progress.

100. UDAIGIRI CAVES, UDAIGIRI, DISTRICT VIDISHA.— In continuation of the last year's work (1992-93, p. 157), the stone pitching laid on cement-concrete base to prevent soil erosion and improve the frontage of Caves 7 to 17 has been completed. R.C.C. cantilevered slab was laid over the door of Cave 19 in order to protect the *amrita-manthana* panel on the door-lintel against sun and rain was also completed.

PRESERVATION OF MONUMENTS

101. BIJAMANDAL, VIDISHA, DISTRICT VIDISHA.— In continuation of the last year's work (/ 992-93, p. 157), the matching sandstone-blocks were procured for restoring the missing *rathas* of the temple *jagati* remained in progress. Desilting of the *baoli* in order to repair the side walls which are damaged and bulged out also remained in progress.

Bhubaneshwar Circle

MADHYA PRADESH

102. CHANDRADITYA TEMPLE, BARSOOR, DISTRICT BASTAR.— The sculptures lying in store and selected to be fixed in appropriate places were now refixed in the wall in two-tier system. The work is in progress.

103. GANESA IMAGES, BARSOOR, DISTRICT BASTAR.— The cordoning of the pillared *mandapa* which accommodates the two colossal Ganesa images was done by fixing up ornamental grills. To avoid misuse of stone images the area around was cordoned off.

104. MAMA-BHANJA TEMPLE, BARSOOR, DISTRICT BASTAR.— The existing barbed wire fencing very close to the temple, was dismantled and the entire acquired area was cordoned off with barbed wire fencing. The land was also levelled for gardening operation.

105. KANTI DEUL, RATANPUR, DISTRICT BILASPUR.— In continuation of previous year's work (1992-93, p. 158), the reconstruction work is in progress. The temple was raised up to a height of four metres vertically from ground level. The missing architectural pieces were simulated and fixed. The ornamental ceiling and architectural members were put back in their original position

The construction of a temporary store-cum-sculpture-shed was completed.

106. MAHADEV TEMPLE, TUMAIN, DISTRICT BILASPUR.— The restoration of damaged *sikhara* was completed as per original. Plastering and construction of masonry pedestal inside the newly constructed sculpture-shed was also attended to with a view to installing the exhibits available at the site.

The construction of a sculpture-shed was completed in all respects.

ORISSA

107. BARABATI FORT, CUTTACK, DISTRICT CUTTACK.— The conservation of the newly excavated palace-complex was taken up and twelve huge laterite pillars of so-called Sri Mukunda Deva palace were properly conserved. To arrest land-slides from the western side of the site, dry pitching was provided by maintaining appropriate slope to act as buttress.

108. EXCAVATED BUDDHIST SITE, UDAYAGIRI, DISTRICT JAJPUR.— In continuation of previous year's work (1992-93, p.158), the much damaged stupa (pl. XLVI) on the south-east of the Udayagiri complex was taken up and restored as per the clues found during the excavation.

The missing brick-masonry of the western side monastic cells were conserved by raising the height of existing wall upto a considerable extent and the top was watertightened to prevent growth of vegetation. The damaged side walls of the sanctum were restored with dressed bricks collected from the site (pl. XLVII).

109. ASURGARH FORT, NARLA, DISTRICT KALAHANDI.— The construction of two units of staff quarters were completed.

110. ANANTA-VASUDEVA TEMPLE, BHUBANESHWAR, DISTRICT KHURDA.— The watertightening of the roof of the *jagamohana* of Ananta-Vasudeva temple was taken up and completed.

111. RASIKA RAY TEMPLE, HARIPURGARH, DISTRICT MAYURBHANJ.— The arched openings of terracotta temple having multiple cracks and crevices including collapse of architectural portion were conserved with utmost caution. The *pradakshinapatha* which had become undulating and covered with half-a-metre debris overgrown with vegetation was cleared and provided with a brick-floor.

The underpinning work was carried out on the outer wall from where the brick-masonry had worn out considerably. The dislodged eastern corner of the temple was consolidated.

112. SUN TEMPLE, KONARAK, DISTRICT PURI.— The damaged weather-proof coat provided in the past over the platform on western side of the temple was removed for relaying a fresh one to prevent seepage of water.

113. JAGANNATHA TEMPLE, PURI, DISTRICT PURI.— The repairs to the *garbha-griha* was taken up jointly by the O.S.I.C., CALTECH, CICO and the State Government. During the clearance of the second storey of the *sikhara* of the main temple, a huge amount of paddy grains were recovered. Steel truss prepared by O.S.I.C. was installed. The consolidation of vertical inner walls of the ground floor by drilling holes and injecting cement polymer mixture was executed. The vertical cracks were stitched and strengthened by fixing sixteen stainless steel 'L' shaped strips. About eighty corbels were pinned by drilling holes and inserting 1 m to 1.5 m stainless rods. The eastern arched corridor of the first floor inside the walls and corbels and the second floor were also grouted for strengthening the core. Two 4" holes were also drilled on the ceiling of first floor to allow proper ventilation into the *garbha-griha*. Outside the temple, the cracked joints of the *garbha-griha* were also grouted and underpinned to arrest water leakage inside the temple.

Besides, the clearance work of the *garbha-griha* of the *ratnasimhasana* was also completed.

The deplastering of the *sikhara* (pl. XLVIII) of the temple on the northern side exposed the second miniature *sikhara* on vertical plain.

Reconstruction of the missing slopy roof of the *kurmibeda* on the eastern side was completed.

The replacement of the damaged architectural members of Khirachora Gopinatha was taken up and the work is still in progress.

Calcutta Circle

WEST BENGAL

114. RADHESHYAM TEMPLE, BISHNUPUR, DISTRICT BANKURA.— Restoration of the frontal facade including the gallery, cornices, arched-roof and the walls on four sides were taken up (pl. XLIX). The architectural and ornamental motifs and the styles were retained as original. The roof of the main entrance of the Nahabatkhana was relaid with *With-surkhi* mortar. The frontal arches on the eastern and the southern sides were strengthened with due insertion of steel plates.

The interior wall surface was plastered with lime-*surkhi* mortar. Proper plastering was also provided to the staircase and the *sikhara*. Arrangements have also been made for proper drainage of rain-water accumulating inside the compound-wall.

115. RADHA BINOD TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The collapsed frontal portico (pl. L) was restored as per original arrangement of the structural components with complete re-setting of the bulged-out exterior on the rear side. The temple at the base was provided with a brick apron. The barbed wire fencing was refixed.

116. GROUP OF TEMPLES, KALNA, DISTRICT BARDHAMAN.—The damaged roofs and brick-walls of the Badrinarayanji and Radhaballavji temples in the Krishnachandraji temple-complex were restored with necessary brick-work, and by changing their worn-out beams, *bargahs* and brick-tiles along with the renewal of the lime-concrete roof-terracing and plastering. The entire flooring of both the temples and their platforms were renewed. The damaged doors and windows were properly repaired and painted.

117. GATEWAY OF RAJBARI-COMPLEX, PRATAPESVAR AND LALJI TEMPLES, KALNA, DISTRICT BARDHAMAN.— The damaged brick gateway of the Rajbari-complex was repaired after careful removal of all the wild growth of vegetation. The damaged roof of the gateway was relaid and the beams, *bargahs* and brick-tiles were changed. The walls were repaired with necessary brick-work and lime-concrete plastering. The floor was renewed and the door-frames and window-shutters were repaired. Necessary brick-work was done to prevent water stagnation inside the Lalji temple compound due to the overflow of an adjacent tank on the western side of the brick compound. One metal sheet gate was fixed at the entrance of the temple-complex to prevent unauthorised entry inside the protected area.

118. MAHARSHI BHAVAN, CALCUTTA, DISTRICT CALCUTTA.— The rooms and verandahs covering an area of 120 sq m in the second floor of the building on the northeastern portion was thoroughly repaired by plastering the walls and changing the damaged beams, *bargahs*, doors and window-shutters. As per the recommendation of the Expert Advisory Committee, a later brick-wall running from north to south at the roof top and a RCC shed over the verandah on the northern part of the building in the second floor were dismantled to retain the original character of the building (pi. LI).

119. COOCH BEHAR PALACE, COOCH BEHAR, DISTRICT COOCH BEHAR.— The damaged roof was treated with lime-*surkhi* mortar by removing the dead. The decayed plaster on the parapet was removed and replastered with 25 cm thick mortar. The cracks and fissures in the roof were treated with cement/epoxy grouting. To prevent leakage in the roof a layer of araldite was spread besides the usual water proofing components. After a careful removal of the old coverings of tin and pudding in the cracks at the base of the metal dome, it was treated with metallic epoxy.

120. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD.—The disturbed stone-slabs of the floor of the verandah in the first floor were relaid with necessary packing and lime cushion. The damaged *bargahs* and brick-tiles of the sloping roof against the pediment were changed and relaid with 8 cm thick lime-concrete. The missing wood-carvings on the ceiling were renewed. An iron netting was provided to prevent an entry of the bats and pigeons through the ceiling holes. The top of the parapet was also treated with 25 cm thick lime-*surkhi* plaster.

121. IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.— The damaged roof-terrace on the southern side over the main gate was partly dismantled for providing a new beam. The roof adjacent to it on the southern side was relaid by fixing new beams and spreading tiles in two layers and covering the surface with *lime-surkhi* concrete. The damaged marble floor of the covered verandah on the eastern side was suitably replaced. The front of the staircase leading to the first floor of Imambara was relaid by lime-concrete.

The two domes on the right side of the main entrance were repaired with 5 cm thick lime-concrete mortar.

Chandigarh Circle

HARYANA

122. BAOLI GHANUS ALI KHAN, FARUKH NAGAR, DISTRICT GURGAON.— Underpinning, watertightening and restoration of R.R. stone masonry of the left side of gate of *baoli* including plaster on walls and entrance gate were taken up and completed as per the original.

123. ANCIENT STUPA, AGROHA, DISTRICT HISSAR.— Underpinning, watertightening and resetting of the ancient stupa with the old Kushan bricks were carried out as per the original.

124. FEROSHAN PALACE, HISSAR, DISTRICT HISSAR.— Lime-cement concrete was provided under the platform wall and apron; R.R. masonry work was also provided on the platform as per necessity besides carrying out underpinning, watertightening on the mosque wall as well as some restoration work in the courtyard of mosque.

125. PRITHVIRAJ CHAUHAN'S FORT (RUINED FORT), HANSI, DISTRICT HISSAR.— The work of tile/*lakhauri* brick-masonry under and in front of the main gate was executed. Besides, the stone-flooring in the gate passage was pointed.

126. KOS-MINAR, AMIN AND THANESAR, DISTRICT KURUKSHETRA.—The work of underpinning, watertightening with *lakhauri/tile* brick-masonry in lime-cement mortar was executed on each of the Kos-Minars followed by plastering.

127. HARSH-KA TILA, THANESAR, DISTRICT KURUKSHETRA.— The scientific conservation of excavated remains was carried out by dismantling the excavated structure (pi. LII) bit by bit from the top and then resetting it.

128. SHEIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.— The western side wall was conserved by underpinning, watertightening and pointing. The restoration work of the staircase of the tomb was taken up and completed as per the original pattern.

129. SHAHJAHAN-KI-BAOLI, MEHAM, DISTRICT ROHTAK.— Restoration of the steps of the *baoli* and underpinning, watertightening at select patches on the walls with *lakhauri* brick-masonry was taken up and completed.

130. MUGHAL SARAI, GHRAUNDA, DISTRICT SONEPAT.—The works of underpinning, watertightening and restoration were carried out on the ceiling of the main dome as well as walls/rooms of southern gate.

PRESERVATION OF MONUMENTS

PUNJAB

131. RAM BAGH GATE (DEODI MAHARAJA RANJIT SINGH), AMRITSAR, DISTRICT AMRITSAR.— The bracket-stone below the *chhajja* was partly attended to.

132. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR.— Partial restoration, resetting, underpinning and pointing were taken up (pl. LIII).

133. MUGHAL BRIDGE, JAHANGIR, DISTRICT JALANDHAR.— The works of restoration, reproduction of brick flooring, underpinning, watertightening and restoration of disturbed masonry with *lakhauri* bricks were taken up and completed.

134. NOORMAHAL SARAI, NOOR MAHAL, DISTRICT JALANDHAR.— Restoration, resetting and underpinning with *lakhauri* bricks in arches, dome and wall were taken up and completed (pl. LIV).

135. KOS MINAR, SANEHWAL, DISTRICT LUDHIANA.— The works of restoration of the platform, underpinning, watertightening and restoration of disturbed masonry with *lakhauri* bricks is in progress.

136. MOHAMMAD MOMIN AND HAZI ZAMAL'S TOMB, NAKODAR, DISTRICT JALANDHAR.— The works of underpinning, watertightening and restoration of disturbed masonry with *lakhauri bricks* and pointing of the joints were completed.

Delhi Circle

DELHI

137. JAMI MASJID, DELHI.— In continuation of the last year's work (1992-93, p. 162) decayed and worn-out red sandstone slabs of the flooring of the courtyard were taken out and replaced with newly dressed red sandstone slabs as per the original level, texture and pattern without altering the slabs in good condition or having the mason marks. One of the broken marble turrets on the southern gateway was repaired and refixed.

138. MAGAZINE GATEWAY, G.P.O., DELHI.— Damaged and fallen arches of the monument were restored by way of *lakhauri* brick-masonry involving underpinning, pointing and plastering.

139. RED FORT, DELHI.— Decayed lime-plaster of the tank in front of Rang Mahal was removed and replastered as per the original pattern in conformity with its texture. The lime-concrete floor was laid after consolidating the under layer and underpinning of *lakhauri* brick-walls was undertaken on the surrounding walls of the tank. Red sandstone fountains were provided as per evidence available in the tank taking proper care about their levels and positions to match the original pattern.

The missing or loose *pietra dura* work in the Diwan-i-Khas was carried out.

Decayed and damaged plaster of the Rang Mahal and Hammam was replaced with composite mortar laminated with *chunam* plaster on the exterior walls in consonance with the original pattern as per available evidence. The damaged and bulged-out parts of the southwestern bastion of the barbican of Lahori gate were repaired by way of stabilising the core masonry, replacing the decayed red sandstone slabs and pointing the joints strictly in consonance with the original pattern.

Vegetational growth was removed in Salimgarh fort and repairs were undertaken in the two barracks where prisoners of Indian National Army were kept in 1945.

Walls of Asad burj were repaired by way of underpinning, pointing of joints and plastering with combination mortar.

140. ASOKAN ROCK EDICT, EAST OF KAILASH, NEW DELHI.—Boundary pillars around the protected area were re fixed and a shed was provided over the rock edict to protect it from natural vagaries.

141. AZIM KHAN'S TOMB, NEW DELHI.— The newly protected monument was given a face lift by pointing the joints of its walls with composite mortar and relaying the damaged flooring matching with the original one.

142. HUMAYUN'S TOMB, NEW DELHI.— The fountain in the courtyard was reactivated. Walls and cells near Isa Khan's tomb and Afsarwala mosque were repaired by way of underpinning the stone masonry and pointing the joints with composite mortar.

143. LAL BANGLA, NEW DELHI.— The twin tombs in the Delhi Golf Course area were provided with M.S. railings and M.S. gate for protection from misuse.

144. LODI TOMBS, NEW DELHI.— Vegetational growth over the mosque (pl. LV) near Sheesh Gumbad tomb were removed and underpinning was carried out in the brick-structure. Cracks were stitched and lime-plaster was provided matching the original texture.

Extensive repairs were undertaken to stabilise the structure of the double-storeyed structure in the Lodi garden by removing the tree roots, watertightening the roof and surface, underpinning and resetting of *lakhauri* bricks in walls and plastering the wall with lime-plaster as per original (pl. LVI).

145. NEELA GUMBAD, NIZAMUDDIN EAST, NEW DELHI.— Lime-concrete floorings were provided and pointing of joints was carried out. M. S. gates were provided in the monument to stop its misuse.

146. PURANA QILA, NEW DELHI.— The southern bastion which has fallen earlier was repaired after providing stone-masonry as per original pattern. The bulged facade of Qila-i-Kuhna mosque was repaired after taking out the veneering stones and resetting the same after strengthening the core masonry.

147. QUTB MINAR, NEW DELHI.— In continuation of the last year's work (1992-93, p.163) the cracked, worn-out and flaking stones were taken out layer by layer and cracks in the inner core were grouted. Some of the old veneering stones were chiselled and shaped and profusely flaked and damaged ones were replaced after recording and reproducing the decorative pattern as per original. Rusted iron clamps were also replaced with copper clamps (pl. LVII).

148. SARAI SHAHJI, MALVIYANAGAR, NEW DELHI.— Coursed rubble masonry was strengthened by way of underpinning and pointing the joints to stop seepage of water.

PRESERVATION OF MONUMENTS

149. SULTAN GHARI'S TOMB, NEW DELHI.— The Mughal period house-complexes towards the north of the tomb were exposed after scientific clearance work and their walls were repaired through underpinning and pointing.

150. TUGHLAQABAD FORT, NEW DELHI.— Scientific clearance work was carried out at the citadel area and the Vijai mandal was repaired by way of resetting the stone-masonry and pointing the joints.

Guwahati Circle

ARUNACHAL PRADESH

151. TWANG MONASTERY, TWANG, DISTRICT TWANG.— In continuation of the previous year's work (1992-93, p. 162), brick partition walls were provided and doors and windows were fixed in the store building. Outer stone-masonry walls above the second floor were restored upto the roof-level including reproduction of traditional designs. Flooring work at the first floor was completed. Retaining-wall on the east side of store building was restored.

ASSAM

152. BISHNUDOL, JOYSAGAR, DISTRICT SIBSAGAR.— The decayed decorative plaster on the outer surface of the temple *sikhara* was removed and replastered in composite mortar as per the original.

153. SIBDOL, SIBSAGAR, DISTRICT SIBSAGAR.—The fallen portion of the roof of the *mukha-mandapa* due to incessant rains was cleared and loose concrete masonry was removed. The brick-work of the collapsed portion was reset.

MANIPUR

154. TEMPLE OF VISHNU, BISHNUPUR, DISTRICT BISHNUPUR. — Old damaged wire-net fencing was removed and new one was provided including erection of missing M.S. angle iron posts. The monument and the compound were cleaned of unwanted growth.

MEGHALAYA

155. STONE MEMORIAL OF U-MAWTHAW-DUR BRIEW, NARTIANG, DISTRICT KHASHI AND JAYANTIA HILLS. — Vegetational growth from the compound was removed and stone monoliths were cleared of moss and lichen.

NAGALAND

156. REMAINS OF FORT, DIMAPUR, DISTRICT KOHIMA. — Stone monoliths were cleared of moss and lichen growth. The compound and ancient tank were made presentable by clearing vegetation and growth of weeds.

TRIPURA

157. TEMPLE OF CHATURDASA DEVATA, UDAIPUR, DISTRICT SOUTH TRIPURA. — The bulged and decayed portion of the brick compound-wall on the northern side was taken out and restored as per original pattern. Brick-on-edge plinth protection was provided around the *nata-mandapa*. The *mandapa* floor was repaired by providing lime-concrete.

158. SCULPTURES AND ROCK-CUT RELIEF OF UNAKOTI TIRTHA, DISTRICT NORTH TRIPURA. — The damaged steps were repaired and cracks were grouted and filled up with composite mortar.

Hyderabad Circle

ANDHRA PRADESH

159. MONOLITHIC NANDI, LEPAKSHI, DISTRICT ANANTAPUR. — A pipe-line was laid from the acquired land along with borewell to the monolithic *nandi* for improving its environs by way of laying garden and for drinking water. Spotlights were also provided.

160. SRI-VIRABHADRA TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR. — The leaking roof of *Somawara mandapa* was rendered watertight and repairs to the stucco-work of the *brick-sikhara* of *Uyyala mandapa* within the temple-complex were also carried out.

161. PENUKONDA FORT, PENUKONDA, DISTRICT ANANTAPUR. — The protected area was enclosed with barbed-wire on stone-posts. The pathways were consolidated by spreading gravel and minor repairs were carried out to *nandi* of the stepped-well.

162. SRI-CHINTALA-VENKATARAMANA TEMPLE, TADIPATRI, DISTRICT ANANTAPUR. — The roof of the reconstructed *kalyana-mandapa* was rendered weather proof by grouting the joints in-between the stone-slabs and laying brick-jelly concrete including plastering over it. The floor of the *kalyana-mandapa* was also relaid and basal mouldings fixed in position.

163. CHANDRAGIRI FORT, CHANDRAGIRI, DISTRICT CHITTOOR. — In continuation of the last year's work (1992-93, p. 165), the missing balconies on the second floor of the Raja Mahal were restored and the missing *chhajja* stones of top floor were replaced with new ones in conformity with the original ones and watertightened. The *brick-sikhara* over the *garbha-griha* of the Rajarajesvari temple was consolidated by underpinning and pointing. Iron-grill doors were provided to all temples in the fields. The clearance work which was carried out in and around the temple brought to light stone *adhishtana* of *gopuradvara*, structural remains and some architectural members. The hidden outer *prakara* was also exposed.

164. SRI-PARASURAMESVARASVAMY TEMPLE, GUDIMALLA, DISTRICT CHITTOOR. — In continuation of the last year's work (1992-93, p. 165), the roof of the temple was watertightened by fixing terracotta tiles and pointing the joints.

165. FORT, SIDDHOUT, DISTRICT CUDDAPAH. — The decayed lime-concrete and vegetational growth over the first entrance *mandapa* was removed and the entire area was watertightened by replastering and laying double course of terracotta tiles over it.

166. SRI-SOUMYANADHASVAMY TEMPLE, NANDALUR, DISTRICT CUDDAPAH. — A breach in the northeastern side *prakara*- wall was rebuilt with available and new stones matching with the original and consolidation of the core with bricks. Further, a fallen portion of the *stepped-pushkarini* (tank) was restored and the area adjacent to it was reset and pointed.

PRESERVATION OF MONUMENTS

167. SRI-PARASURAMESVARA TEMPLE, ATHIRALA, DISTRICT CUDDAPAH. — The apsidal *sikhara* over the *garbha-griha* was strengthened by replastering wherever necessary and the wood-work was treated and painted. A new teak-wood door was provided to the main entrance of the shrine.

168. SRI-KODANDARAMASVAMY TEMPLE, VONTIMITTA, DISTRICT CUDDAPAH. — The uneven stone floors at the southern and northern entrances were removed and relaid with proper gradient to drain off the water, besides resetting and pointing of the disturbed steps.

169. SRI-BHIMESVARASVAMY TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI. — The ongoing work of consolidating the southern *brick-gopura* like removing the decayed plaster and redoing the same including repairs to the stucco figures was completed.

170. SRI-GOLINGESVARASVAMY TEMPLE, BICCAVOLU, DISTRICT EAST GODAVARI. — The decayed lime-plaster and modern accretions over the *gopura* were removed and replastering is in progress.

171. SRI-KAPOTESVARASVAMY TEMPLE, CHEJERLA, DISTRICT GUNTUR. — The fallen breaches of the outer *prakara* were plugged as per existing one with available as well as new stones. Minor repairs to the existing iron-gate was also attended to.

172. MAHACHAITYA, AMARAVATI, DISTRICT GUNTUR. — One metre wide concrete was provided all around over the brick-wall (drum) of *Ma/ia*-stupa. The stone-masonry drain was constructed on the southern side of the stupa to drain out the rain-water. The area around the *Maha*-stupa for a radius of 10 metres was also cleared for levelling and exposing the buried structural remains.

173. AFRICAN BODYGUARD ROOMS, GOLCONDA, DISTRICT HYDERABAD. — The decayed plaster of the ceiling and interior walls including redoing the stucco designs on the north side of the African bodyguard room was removed and replastering is in progress.

Reconstruction of the breach in the fort-wall near the entrance gate leading to the range office, restoration of fallen walls along the pathway leading to Rani Mahal near the western end of Aslah Khana were completed.

174. ARMOURY HALL, BANDAR FORT, MACHILIPATNAM, DISTRICT KRISHNA. — The damaged window-shutters, doors and ventilators were repaired, treated and painted to prevent from further decay. The area was partially cleared of the vegetational growth and debris.

175. NAVABRAHMA GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHABOBNAGAR. — Four broken stone beams of Bala-Brahmasvamy temple were replaced with new ones and the roof relaid and watertightened. The central portion of the roof of the *mandapa* of Arka-Brahmasvamy temple which was open to sky was closed by acquiring some new slabs and the entire roof was made weather-proof by relaying brick-jelly concrete with hydrated lime and plastering over it.

176. SRI-RANGANAYAKULASVAMY TEMPLE, UDAYAGIRI, DISTRICT NELLORE. — The pathway in-between the main *gopura* and *garbha-griha* was relaid and the missing flooring in the *mandapa* was relaid and pointed properly. The protected area in front of the main *gopura-dvara* was fenced with barbed wire on angle iron posts.

177. SRI-PITIKESVARA GROUP OF TEMPLES, PITIKAYAGULLA, DISTRICT PRAKASAM.—The brick-apsidal shrine was strengthened by underpinning and stone-pitching to stop ingress of water into the foundations.

178. BUDDHIST REMAINS, SALIHUNDAM, DISTRICT SRIKAKULAM. — The damaged brick structures at the lower terrace of the Buddhist site, like high walls on either side of the *chaitya* and stupa, were strengthened by way of removing the pulverized bricks and replacing them with the available ones. Vestiges of pillared-hall, votive stupas, etc., were cleaned, brushed and strengthened by refixing the top two layers and watertightening the top.

179. THOUSAND-PILLARED TEMPLE, HANAMAKONDA, DISTRICT WARANGAL. — A part of the missing *prakara-wall* on the eastern side was rebuilt using stones of similar size and texture. The work of providing flood-lighting in the Thousand-Pillared temple-complex entrusted to C.P.W.D. was also completed.

KARNATAKA

180. AHMAD SHAH WALIUL-BAHMANI'S TOMB, ASHTUR, DISTRICT BIDAR. — The damaged and decayed lime-concrete of the dome was removed and repaired by relaying fresh lime-concrete, finished with plastering. The sides of the walls of the upper structure were also replastered wherever necessary. All the windows were provided with welded mesh to stop the entry of bats and pigeons.

181. BARID SHAHI TOMBS, BIDAR, DISTRICT BIDAR. — The vast open area around the tombs of Ali Barid, Ibrahim Barid and Khasim Barid were provided partly with barbed wire fencing on angle iron posts to prevent encroachments.

Jaipur Circle

RAJASTHAN

182. MARBLE PAVILIONS AND BALUSTRADE ON THE ANASAGAR BANDH AND THE MARBLE HAMMAM BEHIND THE ANASAGAR BANDH, AJMER, DISTRICT AIMER. — Final finishing on the restored marble of the Khan-i-Khana gateway was completed. Dismantling of loose and damaged concrete of the platform and relaying the fresh concrete was continued.

183. ANCIENT SITE, BHANGARH, DISTRICT ALWAR. — The works of exposing the buried shops (31 to 50) and the south side bazar (shops 1 to 20) and repairing by way of underpinning the R.R. masonry walls, sunken pointing the open joints and relaying lime-cement concrete floor were continued. The laying of the pathway from Hanuman Gate to Bazar was taken up.

184. KESHAVRAI TEMPLE, DISTRICT ALWAR. — The flooring of the courtyard around Keshavrai temple was relaid with chisel dressed stones over the bed of lime-cement.

185. MANGLADEVI TEMPLE, DISTRICT ALWAR. — The works of filling up the wide gaps of the *sikhara* of the temple with the lime-cement concrete and pointing the joints were completed.

PRESERVATION OF MONUMENTS

186. SIVA TEMPLE AND RUINS, ARTHUNA, DISTRICT BANSWARA.—Dismantling of the old dead lime plaster of the dome, exterior wall and roof of the Hanumana temple was done and surfaces replastered, dismantling of the broken ones and providing and fixing new stone *chhajjas*, the dismantling of the dislodged and bulged ashlar stone plinth and ashlar stone flooring and resetting the same with old/new stones were also executed as per the original.

Restoration of the damaged Kuber temple was also carried out.

187. DIG PALACE, DIG, DISTRICT BHARATPUR. — Replastering of the overhead water-tank from outside was done in continuation of the last year's work.

Plastering of the remaining half portion of the roof of the Sawan-bhavan was completed.

Underpinning the R.R. masonry and plastering work of Gopal-bhavan at the basement is in progress.

In continuation of the previous year's work (1992-93, p. 168), repairs to the fountain beds were carried out by laying lime-cement concrete.

The repairs to the collapsed compound wall at Singh-pol was also initiated.

188. FORT, BHARATPUR, DISTRICT BHARATPUR. — Repairs to the breached fort-wall by R.R. masonry, sunken pointing of the wall surface and parapet in the lime-cement mortar was continued.

Underpinning the R.R. masonry of the wall and sunken pointing of the same was also done.

189. FORT, CHITTORGARH, DISTRICT CHITTORGARH. — Dismantling and demolishing of the old bulged R.R. masonry of the wall of Bhamashah *haveli* and reconstruction of the same in lime-cement-concrete after dismantling the old and pulverised lime-concrete and pointing of joints of stone-masonry were carried out.

190. BAORI, ABANERI, DISTRICT DAUSA. — A low level linear pedestal in R.R. masonry was constructed in the verandah for displaying the sculpture.

191. LAXMI-NARAIN TEMPLE, AMBER, DISTRICT JAIPUR. — In continuation of the previous year's work (1992-93, p. 169), dismantling of the decayed portions of the flooring, courtyard and relaying of the same with new rough-dressed ones laid in lime-mortar was completed.

192. FORT, JAISALMER, DISTRICT JAISALMER. — In continuation of the previous year's work (1992-93, p. 169), dismantling of a portion of the bulged-out and damaged lower fortification wall, reconstruction of the wall in R.R. masonry and resetting of the ashlar stone-masonry were continued.

The collapsed portion of the wall was reconstructed in lime-cement mortar with dressed (old/new) stones by maintaining the original batter and alignment of the wall including the work of providing weep-holes.

193. BUDDHIST CAVES, PILLARS AND IDOLS, KOLVI, DISTRICT JHALAWAR. — Construction of an approach road from the foot of the hill upto the caves on the top has been done by providing R.R. masonry steps. A parapet on the outer edge of the hill was provided for safety of the visitors. Debris of the collapsed roof of Cave 14 was also removed.

194. FORT, KUMBHALGARH, DISTRICT RAJSAMAND. — In continuation of the last year's work (1992-93, p. 169), the debris of the collapsed *sabha-mandapa* of the Golerao Temple 2 was cleared. Serviceable architectural members like columns, lintels and capital stones were sorted out and stacked.

Reconstruction of the *sabha-mandapa* was taken up by using available structural members after making necessary grooves and dressing of stones, fixing of copper-dowels and clamps, etc.

The brick-and-stone-masonry on the roof of the *garbha-griha* and the *antarala* was reconstructed as per original after dismantling the uneven and dislodged layers. Sunken pointing carried out over the exterior and interior of the ashlar stone surfaces of the temple from the plinth to the roof level.

Heavy lintels of the Bawan-deori (Jaina temple) which had cracked and was supported by stone-masonry, walls in mud-mortar were strengthened by providing concealed R.S. joists after cutting chases in the damaged lintels. The gaps were filled with concrete; the outer surface of the lintels was finished in colour and shape matching with the original by imparting stone effect by way of chiselling the mud-masonry support underneath.

The old paint on the wooden doors and windows of Badal-mahal was removed by rubbing. The surface thus prepared was repainted with enamel paint to give an even shade.

195. FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR. — The repairs to an existing structure were undertaken for developing the building as a site museum. Damaged and decayed plaster was removed and replaced with a fresh one. Cracked lime-cement terrace was removed and relaid with a fresh layer. Broken stone *chhajjas* were replaced with new ones. Construction of R.R. masonry enclosure including fixing a steel gate at the entrance and fixing ornamental grill over the wall, fixing of wooden doors and windows in the building, providing plinth protection to R.R. masonry all around the structures were completed.

The fort-wall from Naulakha Gate to Andheri Gate was repaired by dismantling the old and damaged portion. The top of the wall was watertightened. Repairs to the steps were also carried out by dismantling the old as well as damaged and worn-out ones.

196. KALYANRAJJI TEMPLE, TODARAI SINGH, DISTRICT TONK. — The roof of the temple was watertightened by laying a fresh layer of concrete after removing the old cracked concrete. Damaged floor was repaired by way of resetting the old as well as new stones as per necessity. Damaged plaster was replaced with a fresh one. A gate at the main entrance of the temple was provided to prevent entry of cattles, etc.

Lucknow Circle

UTTAR PRADESH

197. ANCIENT SITE, SRINGAVERAPURA, DISTRICT ALLAHABAD. — The old brick-wall on the north as well as west of the outlet of the tank 'C' was dismantled and a lime-cement concrete shell was provided with the help of shuttering of planks. The brick-wall was reset in fresh mortar. Recessed pointing was also done.

198. COMPOUND WALL, KHUSHRUBAGH, DISTRICT ALLAHABAD. — After dismantling the damaged wall and its coping, the same were reset in lime-cement mortar.

PRESERVATION OF MONUMENTS

199. TOMB OF SULTAN KHUSRO, DISTRICT ALLAHABAD. — Dead and decayed mortar of the pathways on the south of the tomb was removed and relaid afresh. The flag-stones were reset.

200. KALINJAR FORT, BANDA, DISTRICT BANDA. — The accumulated earth was removed and lime concrete flooring was provided in front of Neelakantha temple to facilitate the movement of the visitors.

The south and west side walls of the Raja Aman Singh's palace were dismantled and reset in fresh lime-mortar to strengthen the structure and a thick RCC roof was provided on Rooms 3 and 18 to make the palace more secured. The decayed lime-plaster of old stairs and side-walls were replastered.

The stairs of the Budhi-Budha tank on the north and the west were strengthened by recessed pointing. The loose stones were reset.

After carefully removing the accumulated *malba* around the Pathar Mahal and Moti Mahal, the rubble-stone-masonry wall was reset and watertightened in fresh lime-cement mortar. Stone wall on the south side was recessed pointed.

The fortification wall near Neelakantha temple had gone out-of-plumb and therefore collapsed at places. The rubble-stone-masonry wall was reset and recessed pointing was done on the wall as well as steps leading to the temple.

201. BAGH BADSHAHI, KHAJUHA, DISTRICT FATHEPUR. — The northern wall of Bagh Badshahi was restored by *lakhauri* brick-work laid in lime-cement-mortar and the joints pointed.

202. BRICK TEMPLE, NIBIAKHERA, DISTRICT KANPUR. — The construction of boundary around the temple complex is in progress.

203. LARGER AND LESSER SURANG TEMPLES, DUDHAI, DISTRICT LALITPUR. — In continuation of the previous year's work (1992-93, p. 170), the area around the temples was further cleared of *malba* and vegetation. The flooring of the temple was reset by flag-stones.

204. TALBEHAT FORT, LALITPUR, DISTRICT LALITPUR. — The collapsed fortification wall was restored in rubble masonry.

205. ASAFI MOSQUE, LUCKNOW, DISTRICT LUCKNOW. — In continuation of the previous year's work (1992-93, p. 170), a thick lime plastering in three stages was completed in the southern dome reproducing richly moulded designs. In southwestern parapet, the moulded work on the pillars, arches and cornices was reproduced after removing the decayed plaster.

206. ASAFUD-DAULA'S IMAMBARA, LUCKNOW, DISTRICT LUCKNOW. — Pulverized and decayed plaster of the cells of the outer court towards the northwestern side, facing west, was removed and fresh plaster was provided after underpinning as well as restoring the mouldings in conformity with the original. The floors including outer apron were relaid with fresh lime-concrete.

The missing lime-plaster of the southern facade of the eastern wing, abutting second gateway and having rich mouldings and ornamental designs in patches, were reproduced matching with the original.

207'. BUILDING NORTH-EAST OF DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW. —In continuation of the previous year's work (1992-93, p. 170), the facade of the southern side was repaired by way of underpinning with the *lakhauri* brick-work on the *chhajjas* and cornices, reproducing decorative designs in lime-mortar, matching with the original. The decayed masonry was strengthened by pointing in lime-mortar. The floor was reconcreted.

208. JAMA MASJID, LUCKNOW, DISTRICT LUCKNOW. — The flooring of the southwestern large hall was relaid by providing cement-concrete on the base of the stone ballast and finished with specially toned mortar as per the original. The richly-carved work of the central chamber was reproduced wherever damaged or decayed.

209. MAIN BUILDING, DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW. — In continuation of the previous year's (1992-93, p. 170) work, the side walls of the octagonal tower towards the north east were restored by reproducing richly-moulded designs and providing lime-plaster. Pointing, underpinning and crack-filling were also attended to.

A dwarf compound-wall in brick-masonry with ornamental iron-grill fixed on it was constructed towards north-west and northern side of the monument.

210. MUSHEERZADI'S TOMB, LUCKNOW, DISTRICT LUCKNOW. — In continuation of the previous year's work (1992-93, p. 170), the basement of the tomb was repaired by way of underpinning with *lakhauri* brick work and crack-filling with lime-cement mortar. The graves were restored and replastered. An arch-shaped iron-grill in the basement was provided for proper ventilation.

The temporary iron sheet door was replaced by iron-grill door. The basement, first floor and also the apron around the tomb was lime-concreted.

211. RESIDENCY COMPLEX, LUCKNOW, DISTRICT LUCKNOW. — The partly damaged compound-wall of Residency on the eastern and western sides was reconstructed.

The rotten wooden beams of the portico of Model Room of the Residency and the pillars on which rests the portico roof are being replaced with new wooden members.

212. SHAHI BAOLI, LUCKNOW, DISTRICT LUCKNOW.—Upper floor of the main chamber of the *baoli* and three large rooms on the eastern and northern sides along with the galleries were replastered in lime-mortar after removing the decayed plaster. The floors of four large rooms and the galleries were lime-concreted.

213. SIKANDERBAGH GATE, LUCKNOW, DISTRICT LUCKNOW. — In continuation of the previous year's work (1992-93, p. 171), the old compound-wall of Sikanderbagh complex on the north-west and beside the main road was replastered.

214. JAINA TIRTHANKARA, MAHOBA, DISTRICT MAHOBA. — A platform in front of the cave was repaired and replastered. The stairs to the cave were restored.

215. KIRAT SAGAR, MAHOBA, DISTRICT MAHOBA. — The foundation of the embankment and the *ghats* were repaired and strengthened by way of resetting the stones and pointing the joints.

PRESERVATION OF MONUMENTS

Madras Circle

KERALA

216. ST. FRANCIS CHURCH, COCHIN, DISTRICT ERNAKULAM. — In order to prevent percolation of water into the foundation, a cement-concrete apron was provided all around the monument. Colour washing was done to the exterior wall surface. The wooden members were provided with a coat of preservative.

217. FORT ST. ANGELO, KANNUR, DISTRICT KANNUR. — The dilapidated causeway over the moat in front of the main gateway was reconstructed in RCC matching with the original including in colour to facilitate easy access to the fort. The fallen fortification on the western side was reconstructed as per the original.

218. BEKAL FORT, PALLIKERE, DISTRICT KASARGOD. — The dilapidated landings on the western side of the fort leading to the sea were reconstructed by using old as well as new laterite stones. The joints were recess-pointed.

219. SIVA TEMPLE, EYYAL (CHEMMANTHITTA), DISTRICT THRISSUR. — The roof of the granary was relaid after removing the decayed wooden members with new ones matching the original in form and size. The dead plaster over the laterite masonry was raked out and a fresh layer of plaster in combination mortar was applied.

PONDICHERRY

220. EKAMBARESVARA TEMPLE, SETTUR, PONDICHERRY. — The brick *vimana* over the sanctum was rendered watertight by consolidating the worn-out brick-work and providing matching plaster.

TAMIL NADU

221. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHENGALPATTU-M.G.R. — The Mahendravarmesvara shrine located in front of the main shrine in the complex was found leaking because of the widening of joints of the masonry due to disintegration of the poor quality sandstone used in the construction. The whole structure was manually pressure grouted using combination mortar with a mix of non-shrinking compound. The joints were recess-pointed matching the original stone members in colour and texture. Some of the worn-out plain architectural members were replaced with sandstone blocks obtained from the vicinity. Similarly, the cement-concrete work done to fill the voids of the worn-out architectural members were also replaced with new sandstone blocks.

222. MUKTESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGALPATTU-M.G.R. — In order to prevent encroachments and to provide security, a random rubble-wall was constructed all around the temple.

223. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGALPATTU-M.G.R. — The remains of bathing *ghat*, exposed last year (1992-93, p. 116), were conserved by strengthening the laterite core and providing the missing granite slabs matching the original in form and size.

224. MUNKUDUMISVARA TEMPLE, P.V. KALATHUR, DISTRICT CHENGALPATTU-M.G.R. — The *prakara* along with the *cloister-mandapa* was dismantled and reconstructed after providing new ceiling slabs and a fresh weather-proof course.

225. DUTCH FORT AND CEMETERY, SADRAS, DISTRICT CHENGALPATTU-M.G.R. — In continuation of the last year's work (1991-92, p. 172), the reconstruction of the fortification on the northeastern corner was completed.

226. TIRUPULISVARA TEMPLE, VAYALUR, DISTRICT CHENGALPATTU-M.G.R. — After completing the reconstruction of the dilapidated subsidiary structures in the complex in the previous years, the main shrine was taken up for reconstruction during this year. The main apsidal shrine was fairly intact whereas the axial *mukha-mandapa* and the oblong *maha-mandapa* added in later times were completely dilapidated. The structure above the *adhishtana* had collapsed leaving only the circular pillars in position. The debris accumulated around the shrine was removed to collect the fallen architectural members for their reuse in the reconstruction. The existing portion of the *adhishtana* was documented and dismantled. A new foundation was laid over which the dismantled portion and three courses of *pada* portion of the *mukha-mandapa* were reconstructed. The work is in progress.

227. MURUGANATHASVAMI TEMPLE, TIRUMURUGANPOONDI, DISTRICT COIMBATORE. -----The Out-of-plumb outer veneer of the Nataraja shrine was dismantled and reconstructed as per the original over a new foundation.

228. BLOCK NO. XXXVI/2 (FORT MUSEUM), FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—The damaged wooden flooring of the Gallery 5 was reconditioned by relaying the old members and also the new ones wherever necessary. The flooring was provided with antitermite treatment.

229. CLIVE'S BUILDING, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS. — The collapsed Madras-type terraced roof of the northwestern portion was restored as per the original. A weather-proof course was provided. Some of the rooms in the building were replastered after removing the dead plaster.

230. FORT ST. GEORGE, MADRAS, DISTRICT MADRAS. — The southern portion of the eastern moat was cleared of debris and rank vegetation. Heavy jungle growth over the rampart on the western side was removed and the rampart was rendered watertight.

231. SUGRIVESVARA TEMPLE, SIRCARPERIYAPALAYAM, DISTRICT PERIYAR. — The reconstruction of the out-of-plumb veneer of the *ardha-mandapa* and *mukha-mandapa* was completed as per the original.

232. TIRUPERUMANDAR TEMPLE (MADATHUKOIL), NANGUPATTI, DISTRICT PUDUKKOTTAI. — The northern portion of the inner *prakara* had gone out-of-plumb due to various reasons. The whole *prakara* together with its *cloister-mandapa* was dismantled after proper documentation. The debris accumulated all around was removed and the architectural members were collected for reuse. Then, over a new suitable foundation, the structure was reconstructed to a length of about 45m as per the original. New stones together with the old stones were used in the reconstruction. Brick-bats mixed in combination mortar was used to fill the core.

233. TIRUVILANGUDY SIVA TEMPLE, SURIYUR, DISTRICT PUDUKKOTTAI. — In continuation of the last year's work (1992-93, p. 173), the pillared *mukha-mandapa* (pl. LVIII), the *nandi-mandapa* and the *Amman* shrine were taken up for reconstruction. These structures were dismantled after proper documentation and reconstructed as per the original over a new foundation.

PRESERVATION OF MONUMENTS

234. FORT, ATTUR, DISTRICT SALEM. — The fallen domes and arches of the Bath were reconstructed as per the original and consolidated. Debris was cleared to expose the original floor level. A revetment wall was constructed over the exposed section of the debris.

235. NITISVARASVAMI TEMPLE, SRIMUSHNAM, DISTRICT SOUTH ARCOT. — In continuation of the last year's work (1992-93, p. 174), the all-brick structure of Haripurisvara shrine in the complex was reconstructed as per the original. The exterior was plastered with combination mortar.

236. SIVAGANGA LITTLE FORT, THANJAVUR, DISTRICT THANJAVUR. — Rank vegetation grown on the northern wall was removed. The brick portion of the wall was reconstructed wherever required and pointed as per the original. Debris was cleared from the western and northeastern corner of the Sivaganga tank and the buried original steps were exposed. The joints of the laterite masonry was recess-pointed.

237. BRIHADESVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHCHIRAPPALLI. — The *madappalli* of the temple was rendered watertight and the flooring was reconditioned. A broken beam in the northern entrance was mended. The undulating flooring of the restored eastern *maha-dvara* was reconditioned. Further clearance of the debris in front of the *maha-dvara* was undertaken.

238. SIVA TEMPLE, VALIKANDAPURAM, DISTRICT TIRUCHCHIRAPPALLI. — Removal of the moss and lichen from over the *gopura* of the *maha-dvara* and the watertightening of the same were undertaken and completed.

239. BHAKTAVATSALA TEMPLE, CHERANMADEVI, DISTRICT TIRUNELVELI. — Fresh weather-proof course over the western and southern sides of the *cloister-mandapa* was provided after removing the dead course in order to render the structure watertight.

240. RAJAGIRI FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR. — The fallen facade of the western and northern wings of the so-called 'Horse Stables' were restored as per the original by reconstructing the fallen domes, arches and the *chhajja*. The facade including the pillars was replastered.

241. KRISHNA TEMPLE, KRISHNAGIRI FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR. — The out-of-plumb veneer of the *garbha-griha* supported by buttress walls was dismantled and reconstructed as per the original. The *mandapa* in front of the temple was also out-of-plumb with a leaking roof. The whole *mandapa* was dismantled and reconstructed with a new weather-proof course.

242. PATTABHIRAMA TEMPLE, NARASINGARAYANPETTAI, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR. — The *adhishtana* of the *maha-mandapa* of the *Amman* and the *Andal* shrine (pl. LIX) were dilapidated as it had no superstructure. A few stones of the *ardha-mandapa* were also missing. The same were reconstructed as per the original after providing the missing stones. The open *mahamandapa* was paved with stones.

Mini Circle, Goa

GOA

243. Museum, Old Goa, District North Goa. — A fallen part of the roof of Gallery 6 and 7 was repaired by replacing the wooden members. In order to prevent the exposed rafters and beams from the public gaze a false ceiling of asbestos sheets was provided.

244. BOM JESUS, OLD GOA, DISTRICT SOUTH GOA. — The decayed beams and rafters of the quadrangle roof on the northern side was repaired by replacing it with new ones. The buttress walls were plastered with cement-mortar mixed with water proofing compounds to stop water leakage. Red oxide was added to it in order to match it with the colour of the exposed laterite.

245. CHURCH OF ST. CAJETAN, OLD GOA, DISTRICT SOUTH GOA. — The dead plaster of the Corinthian pillars at places was removed and a fresh one was applied. Apart from this, the church was also painted with snowcem.

246. SE CATHEDRAL CHURCH, OLD GOA, DISTRICT SOUTH GOA. — The dust and green patina that formed inside were scrubbed thoroughly. The patch plastering was also carried out after removing the dead plaster. The interior was whitewashed.

The foot-path in the Cathedral complex, broken at many places, was repaired. The drainage that had become defunct as it had developed many holes and cracks was also made functional.

247. MAHADEVA TEMPLE, CURDI, DISTRICT SOUTH GOA. — In continuation of previous year's (1990-91, p. 144) work, transplantation of the temple was completed upto twelve layers.

Mini Circle, Shimla

HIMACHAL PRADESH

248. HIDIMBADEVI TEMPLE, MANALI, DISTRICT KULLU. — The work of slatestone roof has been re-fixed. The work of cement-concrete flooring has also been completed as per the original pattern. Dressed stone and wall-masonry with G.I. sheet roof over wooden tresses and rafters were provided. The work of false wooden ceiling was also taken up and completed.

249. SIDHNATH TEMPLE, BAIJNATH, DISTRICT KANGRA.— The flat stone on the roof has been fixed in position. A drain for water outlet has also been provided and grouting of the hollows has been done. C.R. stone-masonry of the wall and platform has been also completed as per the original pattern.

250. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA.— Laying of cement concrete flooring and restoration of C.R. stone-masonry of the walls was completed. A drain with proper slope was constructed to let off the rain-water.

251. TABO MONASTERIES, TABO, DISTRICT LAHAUL AND SPITI.— Laying of pathways, restoration of *chortens* and enclosure wall and stabilizing the foundation of the Gumphas were completed as per the original pattern. The work of conservation of Phoo Gumpha, laying of pathways on the hills, approach to Gumphas were also taken up and the work is in progress.

PRESERVATION OF MONUMENTS

252. MARKULADEVI TEMPLE, UDAIPUR, DISTRICT LAHAUL AND SPITI.— The retaining-wall of the Markuladevi temple, Udaipur was constructed. Lime-cement concrete and R.R. masonry and pointing of the joints were also taken up and completed. The rotten wooden planks of the roof of the temple replaced and the missing ones were provided and watertightening of enclosure walls of the temple by spreading alkathin sheet and earth packing and *gobri lepai* has also been done.

Patna Circle

BIHAR

253. EXCAVATED REMAINS, KOLHUA, DISTRICT MUZAFFARPUR.—Exposed seven-tiered brick-lined tank on the northern and the eastern sides was restored with bricks of special-size by way of underpinning and resetting of the damaged portions thus bringing in plumb line the masonry upto the five tiers.

254. EXCAVATED REMAINS, NALANDA, DISTRICT NALANDA.— Damaged portions of Temple 13 were consolidated by way of watertightening and recessed pointing.

255. ROHTASGARH, ROHTAS, DISTRICT ROHTAS.— In continuation of the previous year's work (1992-93, p. 176) in the palace complex (western side), the floor was laid with lime-*surkhi* mortar in the northern side.

UTTAR PRADESH

256. OLD FORT, JAUNPUR, DISTRICT JAUNPUR.—Restoration work of the southern bastion (pl. LX), close to the second gate of the fort together with the parapet was done as per the original by way of dismantling and resetting the damaged ashlar stones.

257. EXCAVATED REMAINS, KUSHINAGAR, DISTRICT PADRAUNA.— Recessed pointing and watertightening were attended to for consolidating the structures around Nirvan Temple and Mathakur shrine.

258. LAL KHAN TOMB, RAJGHAT, DISTRICT VARANASI.— Construction of a massive retaining-wall towards the east to check the erosion by the Ganges was taken up and is in progress.

259. CHAUKHANDI STUPA, SARNATH, DISTRICT VARANASI.—The eastern face (pl. LXI) of the stupa was exposed and restored with the help of bricks of special size matching the original upto the plinth level.

260. DHAMEKH STUPA, SARNATH, DISTRICT VARANASI.— In continuation of the previous year's (1992-93, p. 176) work, stone encasing was done further with the help of dressed stone-blocks matching the original.

261. EXCAVATED REMAINS, SARNATH, DISTRICT VARANASI.— Votive stupas and the other minor structures were consolidated by way of pointing and watertightening.

262. MAN SINGH'S PALACE, VARANASI, DISTRICT VARANASI.— Damaged plaster was removed and a fresh one was provided as per the original.

Srinagar Circle

JAMMU AND KASHMIR

263. FORT, AKHNUR, DISTRICT JAMMU.— A portion of the buttress-wall in stepped form had crumbled. The same was restored to strengthen the bastion and the fortification wall.

264. SIVA TEMPLE, BILLAWAR, DISTRICT KATHUA.— The partly fallen and partly out-of-plumb platform on the eastern side of the temple was restored as per the original.

265. ALCHI MONASTERY, DISTRICT LEH.— The fallen main wall to the east of Dukhang was reconstructed in stone-masonry. Mud-plaster was also applied over its surfaces. The drain was also covered with slatestones.

266. FORT AT RAMNAGAR, DISTRICT UDHAMPUR.— The wall of the bastion along with marlons and battlements was restored to match with the original (pl. LXII).

267. GROUP OF TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR.— A retaining-wall was provided to arrest the erosion of soil and the embankment on the western side of protected limits of the temple.

268. NAND-BABOR TEMPLE, BABOR, DISTRICT UDHAMPUR.— The missing flooring of the *mandapa* of the temple was restored to match with the original.

269. PHYANG MONASTERY, DISTRICT LEH.—The fallen retaining-wall of the approach on the north side was restored in stone-masonry plastered with mud.

270. SHEY PALACE, DISTRICT LEH.—The crumbled wall supporting the base of the hill over which the fort is built, was restored besides providing stone pathway and reconstructing a stairway to the Dukhang of the palace.

271. STUPA, TISSERU, DISTRICT LEH.— The terraced wall on the eastern side (pl. LXIII) of the stupa was restored at Tier 3. The face of the wall was rendered with a coat of mud-plaster.

272. THIKSEY MONASTERY, DISTRICT LEH.—A portion of the assembly hall was restored with *kail* wood flooring to match the original.

Vadodara Circle

DAMAN AND DIU

273. FORT-WALL (AMMUNITION STORE), MOTI DAMAN, DISTRICT DAMAN.— The work of providing pavement has been completed with the *porbandar* stones.

274. FORT-WALL (SOUTHERN OUTSIDE), MOTI DAMAN, DISTRICT DAMAN.— Underpinning, flash pointing and rough plastering on the wall was completed and the area was fenced with RCC poles and iron gates.

GUJARAT

275. JAMI MASJID, DHOLKA, DISTRICT AHMEDABAD.— The western outer face of ashlar stone-masonry was reset as per the original pattern after dismantling the deteriorated, dead mortar/ashlar stone-masonry.

PRESERVATION OF MONUMENTS

276. MALIK ALAM MOSQUE, DISTRICT AHMEDABAD.— Dressing and carving of new dhrangadhra stones is in progress for flooring.

277. QUEEN'S MOSQUE, SARANGPUR, DISTRICT AHMEDABAD.— The old broken *chhajja* has been replaced with new dhrangadhra stones. The missing *mihirabs* and stone screen (*jali*) were provided with new marble stones as per the original pattern. The dead lime-concrete of the roof was removed and relaid with a fresh one (pl. LXIV).

278. EXCAVATED SITE, SURKOTADA, DISTRICT BHUJ.— The work of barbed-wire fencing round the protected area is in progress.

279. RAO LAKHA CHHATRI, BHUJ, DISTRICT BHUJ.— The work of dismantling and resetting of the hanging members of the *chhatri* are in progress (pls. LXV-LXVI).

280. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.— The works of dressing and carving of new stones for replacing the old weathered members of the corbelled intrados of the dome are in progress.

281. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.— The work of dressing and carving mouldings on the stones are in progress for providing the missing members.

282. CITADEL WALL, PAVAGADH, DISTRICT PANCH MAHAL.—The work of resetting the bulged wall with ashlar stone-masonry is in progress.

283. MAKAI KOTHAR, PAVAGADH, DISTRICT PANCH MAHAL.— The work of resetting of ashlar stone-masonry and R.R. masonry was completed after dismantling the out-of-plumb and bulged out masonry was completed.

284. GROUP OF TEMPLES, KHED RODA, DISTRICT SABARKANTHA.— Reconstruction of ashlar stone-masonry was completed and the stone flooring was provided as per the original pattern. The work of dressing and carving of new stones for the missing as well as damaged or worn-out architectural members is in progress.

285. NAVALAKHA TEMPLE, SEJAKPUR, DISTRICT SURENDRANAGAR.— The works of dressing and carving mouldings on stones for plinth masonry, capitals, pillars and lintels, etc. are in progress.

286. TAMBEKARWADA, VADODARA, DISTRICT VADODARA.— The works of underpinning, watertightening, plastering and pointing were completed.

287. TOMB AT HAZIRA, DISTRICT VADODARA.— The work of providing fresh lime-concrete and plaster was completed after dismantling the dead lime-concrete and plaster of the platform. The work of dressing of new stones is in progress.

MONUMENTS MAINTAINED BY THE STATES

ASSAM

The Directorate of Archaeology, Government of Assam carried out conservation work at the following monuments.

288. GANESH MANDIR RUINS, NAZIRAKHAT NEAR GUWAHATI, DISTRICT KAMRUP.— Approach road was improved by laying cement-concrete.

289. MANGALACHANDI TEMPLE, CHATRAKAR, DISTRICT KAMRUP.— The intrados of the dome of the temple was thoroughly repaired in *lime-surkhi* mortar and the inner walls were plastered.

290. RUDRESVARA TEMPLE, GUWAHATI, DISTRICT KAMRUP.— The northern portion of the arched path inside the basement of the temple was also repaired. The plinth of the *mandapa* was exposed and conserved.

291. ROCK INSCRIPTION, BURHAMANYANG, DISTRICT MARIGAON.— R.C.C. shed was constructed.

292. KANAIBOROEI SITE, NORTH GUWAHATI, DISTRICT KAMRUP.— The area around the three rock-cut inscriptions was improved by providing iron fencing.

GUJARAT

The State Department of Archaeology, Government of Gujarat conserved the following monuments.

293. SIVA TEMPLE, KERA, DISTRICT BHUJ.

294. GANESH TEMPLE, GHUMALI, DISTRICT JAMNAGAR.

295. TEMPLE, SUPEDI, DISTRICT RAJKOT.

296. TOMB CORIYET, RAJGADHI, DISTRICT SURAT.

KARNATAKA

The Department of Archaeology and Museums, Government of Karnataka carried out conservation work at the following monuments.

297. RAMADEVARA TEMPLE, KUDULUR, DISTRICT BANGALORE.

298. KITTUR RANI CHENNAMMA PALACE, KITTUR, DISTRICT BELGAUM.

299. KADASIDDHESVARA TEMPLE, SAUNDATTI, DISTRICT BELGAUM.

300. MANTAPAS, HAMPI, DISTRICT BELLARY.

301. VENKATARAMANASVAMY TEMPLE, HARAPANAHALLY, DISTRICT BELLARY.

302. RANGANA BAGILU, FORT, CHITRADURGA, DISTRICT CHITRADURGA.

303. GANAPATHI TEMPLE, BARKAR, DISTRICT DAKSHINA KANNADA.

304. MUD PALACE, SURAL, DISTRICT DAKSHINA KANNADA.

305. TEMPLE, RON, DISTRICT DHARWAD.

306. CHOR GUMBAZ, GULBARGA, DISTRICT GULBARGA.

307. LANGAR-KA-MASJID, GULBARGA, DISTRICT GULBARGA.

308. KILANDAR KHAN'S MOSQUE AND TOMB, GULBARGA, DISTRICT GULBARGA.

PRESERVATION OF MONUMENTS

- 309. SARAI OF M. KAMAL MUZARRAD, DARGAH SHARIF, DISTRICT GULBARGA.
- 310. RAYAGOPURA, MELKOTE, DISTRICT MANDYA.
- 311. VENUGOPALASVAMY TEMPLE, TONNUR, DISTRICT MANDYA.
- 312. FORT, SRIRANGAPATNA, DISTRICT MANDYA.
- 313. CHAMUNDESHVARI TEMPLE, MYSORE, DISTRICT MYSORE.
- 314. BHUVANESHVARI TEMPLE, PALACE COMPLEX, MYSORE, DISTRICT MYSORE.
- 315. GAYATHRI TEMPLE, PALACE COMPLEX, MYSORE, DISTRICT MYSORE.
- 316. KHILLE VENKATARAMANASVAMY TEMPLE, PALACE COMPLEX, MYSORE, DISTRICT MYSORE.
- 317. KODI BHAIKAVESHVARA TEMPLE, PALACE COMPLEX, MYSORE, DISTRICT MYSORE.
- 318. ARKESHVARA TEMPLE, K.R. NAGAR, DISTRICT MYSORE.
- 319. LAKSHMIKANTHA TEMPLE, KALALE, DISTRICT MYSORE.

MANIPUR

The Department of Archaeology, Government of Manipur carried out conservation work at following monuments.

- 320. MADANMOHANJI TEMPLE, KANCHIPUR, DISTRICT IMPHAL.
- 321. MAHABALI TEMPLE, WANGKHEI, DISTRICT IMPHAL.

X. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS¹

ANDHRA PRADESH

1. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.— The chemical treatment work for removal of soot from the painted surface of this temple was continued. An area of 87 sq metres covering the western wall of Virabhadra shrine, *mukha-mandapa* and Agastya Cave was chemically cleaned and preserved.

2. CHANDRAGIRI SITE MUSEUM, CHANDRAGIRI, DISTRICT CHITTOOR.— The removal of micro-vegetational growth, lime splashes and black accretionary deposits from stone sculptures was continued and an area of 26 sq metre was completed. In addition to this, sixteen bronzes were also chemically treated for the removal of siliceous material and finally preserved.

3. VENKATESVARA-VISHNU TEMPLE, SRINIVASA MANGAPURAM, DISTRICT CHITTOOR.— In continuation of the previous year's work (1992-93, p. 188), the removal of different types of accretions from the entrance tower, *maha-mandapa*, *antarala* and *navaranga*, both interior and exterior, was carried out and a total of 2075 sq metre area was completed.

4. KUDALISANGAMESVARA TEMPLE, ALAMPUR, DISTRICT MAHABOBNAGAR.— Chemical treatment to this transplanted temple was taken up this year for the removal of oil paint markings, micro-vegetational growth, flow marks of cement, lime and thick calcareous deposits. Accretionary deposits were removed by physico-chemical methods with the selective use of sodium hydroxide, ammonia-teepol mixture, sodium thiosulphate, ammonium carbonate and oxalic acid. At some places, hard black deposits in patches were removed by treatment with trichloro acetic acid. An area of about 1269 sq metres was chemically treated and preserved after application of fungicide, santobrite.

5. THOUSAND-PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.— In continuation of the previous year's work (1992-93, p. 188), removal of thick deposits of soot, oil, lime-wash and calcareous accretions was carried out from an area of 173 sq metres. The whole area was preserved with 3% Acrypol-P in toluene.

BIHAR

6. EXCAVATED SITE, NALANDA DISTRICT NALANDA.— The entire area of Sarai mound and votive stupas, situated around Temple 3, were chemically cleaned by eradicating thick layers of moss, lichens and fungi. Fungicide and preservative coats were applied to the cleaned surfaces. Mural paintings inside

¹Information from: 13, 15 and 17, Director of Archaeology, Government of Gujarat and the rest from Director (Science) of the Chemical Branch of the Survey.

the Sarai mound were also cleaned chemically using suitable organic solvents. The cleaned area was preserved with 1 % solution of poly vinyl acetate in toluene.

7. NALANDA MUSEUM, NALANDA, DISTRICT NALANDA.— Some bronze images displayed in the museum were subjected to chemical treatment for removal of the deleterious salts embedded in the patina. The corrosive products were extracted chemically with the help of alkaline Rochelle salt and gentle brushing. Thereafter, the chemically cleaned sculptures were boiled 4 to 5 times in distilled water to remove all the residual salts. The objects were finally preserved.

DELHI

8. RED FORT, DELHI.— The deposition of dust, dirt, soot and greasy matter on the entire structure of Diwan-i-Khas, including the golden floral designs, inlay-work had affected the brilliance, lustre and sheen. The corridors on the east, north and south and the central hall were subjected to chemical treatment by using various chemicals *viz.*, methanol, acetone, hydrogen peroxide, etc. Inlay-work and plain marble surface were cleaned by clay pack method using bentonite. The work is in progress.

In continuation of last year's (1992-93, pp.189-190) work, the chemical treatment was carried out to the ceiling of the chamber, fitted with marble *jalīs*, the east and front halls of Khas Mahal for the removal of dust, dirt and thin film of soot. It helped in restoring lustre and beauty of the floral designs, *jalīs* and plain marble surface.

The entire Hira Mahal was subjected to chemical treatment with clay pack to remove all deposited superficial accretions. The stains which adhered strongly and penetrated to some extent were again subjected to treatment with clay pack technique using selected additives.

Chemical treatment was carried out to remove mild vegetational growth, muddy accretions along with other superficial deposits, patches of calcareous deposits from the three sides of the rampart under flagstaff and two *burjīs*. The micro-vegetational and muddy accretions were removed using dilute solution of ammonia-teepol.

Chemical treatment was continued for the removal of thick accretionary deposits of dust, dirt and greasy matter, etc. from the marble surface of Sawan pavilion. Lower portions of the walls and pillars, plinth and floor areas were taken up. Aqueous dilute solution of ammonia-teepol and clay pack methods were applied for the removal of dust, dirt and greasy matter respectively.

The chemical treatment and preservation work were carried out at different places of Diwan-i-Am including the red sandstone pillars and marble throne studded with multicoloured stone inlay work. The accretions of greasy matter and oil due to hand touching by the visitors, dust, dirt deposit, bird droppings affected the lustre and sheen of the marble surface. The chemical treatment with special reagents and methods restored the original lustre of marble throne and stone pillars. The work is in progress.

9. HUMAYUN'S TOMB, NIZAMUDDIN, NEW DELHI.— In continuation of last year's (1992-93, p. 190) work, the southern side wall of the tomb was taken up for removal of dust, dirt, micro-vegetational growth and remnants of beehives especially from the arched and lower portions of projections. After removing all kinds of accretionary deposits with diluted and mild reagents, the entire cleaned area was given fungicidal treatment with 1% aqueous solution of sodium pentachlorophenate. Finally, the treated area was preserved with 2% solution of poly vinyl acetate in toluene.

10. ILLAHI DARWAZA, QUTB COMPLEX, NEW DELHI.— Eradication of superficial accretions like dust, dirt, oily matters, etc., was continued. The work is in progress.

GOA

11. SE' CATHEDRAL CHURCH, VELHA GOA, DISTRICT PANJIM.— Chemical treatment of mural and panel paintings was continued. About 33 sq metres of painted surface was chemically cleaned and preserved. Besides, colour reintegration at a very few places was also attended to.

12. ST. FRANSIS ASSISI CHURCH, VELHA GOA, DISTRICT PANJIM.— About 10 sq metres surface area of mural paintings in arches below the choir room and four panel portraits were chemically treated and preserved.

GUJARAT

13. ZAVERI'S HAVELI, GANDHINAGAR, DISTRICT GANDHINAGAR.— These carved wooden parts were affected by termites. Therefore, it was necessary to preserve it from further termite effects. For preservation, Hydrin-30 mixed with water/kerosene oil and solution were applied on the wooden parts of *haveli* with spray pump. Hydrin-30 was specially made for protection from termites. Hydrin-30 made some changes in formula Aldrin-30. Also Gammoxin Powder (10% B.H.C.) mixed with kerosene oil or water and paste made of it were applied on wooden carved parts and on cracks of wooden objects.

14. RUKMANI TEMPLE, DWARKA, DISTRICT JAMNAGAR.— Stone sculptures and carvings of the temple were cleaned using ammonical aqueous solution admixed with non-ionic detergent and preserved after proper fungicidal treatment.

15. KHAMBHALIYA GATE, JAMNAGAR, DISTRICT JAMNAGAR.— Dust and dirt particles from both sides of the doors were removed with brush and corrosion effects on iron portion removed with dry brush and with emery paper and then the remaining corrosion effects were removed with kerosene oil.

Dust and dirt particles from the wooden parts of the doors were removed with dry brush. Terry materials on the doors washed with Soda+Teepol mixed solution. The solution applied and rubbed with coir and plastic brush. Then, cleaned with water and after it was completely dried, final preservative coating of linseed oil+Terpentine was applied in 2 : 1 proportion with paint brush to preserve the wooden portion from outside effect. For iron portion preservative coating solution of kerosene oil + petroleum jelly was applied.

16. ASOKAN ROCK-EDICTS, JUNAGADH, DISTRICT JUNAGADH.— The deposits of dust, dirt, bird's excreta and vegetational growths were removed with ammonical solution and non-ionic detergent. The surface consolidation and preservation were carried out with 2% solution of polyvinyl acetate of toluene.

17. JAMI MASJID, UPPARKOT, DISTRICT JUNAGADH.—Dust and micro-organism algae were removed from wall, kanguras, carvings and minars with dry coir brush. Remaining micro-organism was removed with mixed solution of 3% to 5% liquid ammonia + teepol + water. The solution was applied with smooth brush and then rubbed the portion with coir brush and completely washed with water. After the stone

surface was completely dried, fungicide zinc-silico-fluoride zusi F6 5% in water applied. Finally 3% polyvinyl acetate in toluene was applied on carved portion and porous stones of the wall as a preservative coating.

18. RAO LAKHA CHHATRI, BHUJ, DISTRICT KACHCHH.— The thick micro-vegetational growth obscuring the details of the sculptures and carvings were removed with dilute solution of ammonia and teepol mixture (in aqueous medium). The entire area was preserved with 2% polyvinyl acetate solution in toluene after appropriate fungicidal treatment.

19. SUN TEMPLE COMPLEX, MODHERA, DISTRICT MAHESANA.— Small temples, hundred and eight in number, inside the *Surya-kund* were covered with thick vegetational growth and lime deposits. Liquor ammonia, teepol, acetic acid, etc., in dilute solution were used to eradicate these deposits. The entire surface area was cleaned and preserved.

20. MAHATMA GANDHI'S BIRTH PLACE, PORBANDAR, DISTRICT PORBANDAR.— Paintings inside Mahatma Gandhi's birth place had been obliterated due to the deposition of lime wash and other superficial accretions. Suitable organic solvents in appropriate proportions were used with cotton swabs for removal of these accretions. After thorough cleaning, the paintings were preserved with dilute solution of polyvinyl acetate in toluene.

21. HEERA BHAGOL, DABHOI, DISTRICT VADODARA.— Thick vegetational growth of moss and lichen obliterating the sculptures and carvings of this monument were eradicated with aqueous ammonical solution and non-ionic detergent. The work is in progress.

22. HAZIRA TOMB, VADODARA, DISTRICT VADODARA.—Dome of the monument covered with thick micro-biological growth and other superficial accretions like dust, dirt were subjected to chemical treatment using liquor ammonia and teepol solution in aqueous medium: After spraying fungicide on the cleaned surface, the entire cleaned area was preserved.

23. TAMBEKARWADA, VADODARA, DISTRICT VADODARA.— Mural paintings inside Tambekarwada were subjected to chemical treatment to remove accretionary deposits of dust, dirt, smoke and bird's excreta. Methanol, toluene, benzene, diacetone alcohol were used in different proportions 0-6% of polyvinyl acetate solution in toluene was applied on the cleaned painted surface in order to consolidate and integrate the binding media intact with pigments.

HIMACHAL PRADESH

24. LAKSHMI-NARAYANA TEMPLE COMPLEX, CHAMBA, DISTRICT CHAMBA.— Carvings and other details of designs and figures of Gauri-Shankar temple had been obliterated due to the growth of moss and lichens and deposits of lime-plaster, dust, dirt, etc. Micro-vegetational growths were removed by brushing with ammonical water containing non-ionic detergent. A 1-2% aqueous solution of acetic acid was used for the removal of lime-plaster accretions by physico-chemical methods. After removing these accretions, the entire surface was flushed with water and fungicidal treatment with zinc-silico-fluoride. The cleaned surface was preserved with 1.5% polymethyl-methacrylate solution in toluene.

25. KANGRA FORT, KANGRA, DISTRICT KANGRA.— Adinath temple inside the Kangra Fort had been giving a shabby appearance, hiding the natural beauty of the stone and carvings due to thick growths of moss and lichens. The carvings were covered with lime-plaster. Lime-plaster was removed physico-chemically by wetting and loosening the lime with dilute acetic acid- Vegetational growths were eradicated with ammonical solution and teepol using nylon brushes. 1 % aqueous solution of zinc-silico-fluoride was sprayed on the cleaned surface to prevent the quick regrowth of moss and lichen. Finally the entire surface was preserved with 2% solution of polymethyl-methacrylate in toluene.

26. GAURI-SHANKAR AND LAXMI-NARAIN TEMPLES, NAGGAR, DISTRICT KULLU.— Both the structures were thickly covered with hard accretions of moss, lichen, algae and fungus, etc. making their appearance black and shabby thereby hiding natural colour of the stone and fine details of carvings. The inner surface of the sanctum and the ante-room were covered with dark greasy and oily accretions due to regular burning of oil lamps. 2% mixture of ammonia and triethanolamine were also used to remove these accretion together with ammonia and teepol. Vegetational growth from exterior surface was cleaned with solution of ammonical water admixed with non-ionic detergent. The entire cleaned surface was thoroughly washed, applied fungicide after complete drying and preserved with polymethyl-methacrylate solution in toluene.

27. TABO MONASTERIES, TABO, DISTRICT LAHAUL AND SPITI.— Due to dry and cold climatic conditions and ageing, the painted surface as well as the carrier of Duwang Gumpha started losing cohesion. Several horizontal and vertical cracks were observed. Pigment layers started bulging and peeling off. Besides, flaking, blistering and curling were observed at several places. Accumulation of dust, dirt together with smoke and soot due to burning of oil lamps and incense sticks had also obliterated the fine details of the paintings. Cracks and gaps in mud-plaster were filled with recommended fillers mixed with jute fibres and synthetic acrylic emulsion. Peeled and flaked painted layers were refixed with carrier using synthetic emulsion with water and methyl-alcohol. After consolidation, the superficial accretions were removed with suitable organic solvents. Selective colour reintegration of filleted and filled up gaps was also carried out in order to match with the surroundings. The treated areas were preserved with 1% solution of polyvinyl acetate in toluene (pl. LXVII).

28. PANCHAVAKTRA TEMPLE, MANDI, DISTRICT MANDI.—The subsidiary shrine of main Panchavaktra temple was taken up for chemical treatment. This temple, made of soft sandstone having beautiful carvings was covered with thick lime-plaster besides vegetational growths all around. Usual methods and chemicals were used to remove these deposits and the structure was finally preserved with polymethyl-methacrylate solution after fungicidal treatment.

JAMMU AND KASHMIR

29. SHEY PALACE, SHEY, DISTRICT LEH.— Paintings decorating all the four walls of the first floor room from top to bottom were completely obscured due to the deposition of very thick layer of smoke, soot, dust and greasy accretions. Pigments having scratches at many places due to the crude method of dusting and loss of pigments due to abrasion and colour reintegration on the west wall was also observed. It might have been done during an attempt to renovate the paintings by a team of some foreign experts, probably in the last decade.

The chemical cleaning of these paintings was undertaken after the selection of appropriate chemical system. Beautiful paintings with their original bright colours were exposed on account of this method of cleaning. The selection of organic cleaning solvents was made according to their molecular weight, specific gravity volatility, toxicity dust/dirt dissolving capacity, reactivity with pigment materials, etc. The chemical treatment has yielded very encouraging results and helped to expose the paintings to their pristine glory. The paintings have been preserved with 0.5 to 1 percent solution of poly vinyl acetate (pl. LXVIII).

30. DEVI BHAGAVATI TEMPLE, MANWAL, DISTRICT UDHAMPUR.— Outer surface of this temple was covered with growth of moss and lichen and inner portion had deposition of smoke emanated from burning of oil lamps, incense sticks, etc., during ritual ceremonies. The superficial accretions of dust, dirt and the vegetational growths were removed by gentle brushing with liquor ammonia and teepol. Lime-plaster wherever existed was removed by physico-chemical methods using dilute acetic acid. To remove the smoke deposition, little triethanolamine was also added as per the requirement. After thorough washing, the stone surface was preserved with polymethyl-methacrylate after complete drying and fungicidal treatment. The work has been completed.

KARNATAKA

31. ASAR MAHAL, BIJAPUR DISTRICT BUAPUR.— The remaining portion of 277A sq metre of paintings was treated by removing soot deposited over the paintings due to burning of candles and other superficial accretions, filling of gaps and their colour matching with surroundings. The paintings were then preserved with 1 % solution of poly vinyl acetate in toluene after proper chemical treatment.

32. PANCHALINGESVARA TEMPLE, GOVINDANAHALLI, DISTRICT MANDYA.— Chemical treatment was continued on the sculptures of the exterior walls and *vimana* to remove the vegetational growth, lime wash and ochre patches using aqueous solution of non-ionic detergent, ammonium-hydroxide, acetic acid. The fungicidal treatment was given with sodium pentachlorophenate followed by application of a preservative coat of acrypol P 876 in toluene. The work on the exterior walls was completed.

Removal of dust, dirt, mortar and cement marks, soot and oily accretions was initiated on the intricate carvings of inner walls, ceiling, sculptures and *antaralas* of the five shrines.

33. NARAYANASVAMY TEMPLE, MELKOTE, DISTRICT MANDYA.— An area of about 1300 sq metres comprising the walls of eastern entrance, main tower and the inner eastern *prakara* was chemically treated for the removal of oil and sooty accretions, lime-coats and other ingrained accretions. The chemicals used for the purpose were ammonium-hydroxide, non-ionic detergent and dilute acetic acid. The solution of Acrypol in toluene was used as preservative.

34. DARIYA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.— In continuation of the previous year's work (/ 992-93, p. 193), the remaining painted area of 60 sq metre in eastern and western verandahs was completed by consolidating friable pigments, reintegration of gaps and cracks and removal of old yellowish translucent varnish. Chemically cleaned paintings were finally preserved.

35. TIPU SULTAN'S MAUSOLEUM GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA.— The work in volving the removal of superficial accretions, old translucent, brittled and yellowed varnish from the painted interior wall and the dome, filling of lacunae in rendering, etc. was initiated by using chemicals like methyl-alcohol, cellosolve and turpentine as restrainer. The work is in progress.

MADHYA PRADESH

36. KANDARIYA MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.— Chemical treatment was continued on the outer south and west walls of *sikhara* and sanctum for the removal of heavy growths of moss, lichens, algae, along with accretionary deposits of dust, dirt, bird droppings, etc. Cleaned surface was finally preserved with polymethyl-methacrylate solution in toluene after fungicidal treatment.

37. WESTERN GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.— The work of surface consolidation and strengthening of the eroded sculptures in various temples of the western group was continued. Sculptures around the platform and terrace of Lakshmana temple were subjected to surface consolidation in order to protect these unique figures from further decay. The work is in progress.

38. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.— To salvage the valuable mural paintings of Bagh caves, the stripping and mounting work was continued. A piece of painting on the ceiling in eastern verandah of Cave 4 was endangered not only by excessive humidity— a perpetual problem, but also from the instability of its carrier. The painting was stripped off section-wise with most care after consolidating the pigments with 5% solution of polyvinyl acetate. The facing in two layers of cotton fabric was provided over it with thick polyvinyl acetate solution and the paintings when dried were stripped inch by inch in sections with the help of palette knives, chisels and small wooden hammer. Each stripped panel was carefully documented and recorded photographically in order to avoid any confusion while reassembling during mounting. The ground of the painting was reduced to pigment level uniformly after removing extra mud-plaster layer and the fresh ground was prepared with layers of epoxy resin reinforced with fibre glass, plaster of Paris, pre-shrunk cotton gauge with a mixture of fevicol and calcium carbonate as filler. Finally, an intervention layer of aperforated polystyrene sheet followed by a polyurethane foam sheet was fixed with fevicol by applying suitable pressure. These mounted panels could be handled and are ready for display.

To overcome the problem of insect activity and bat's menace, fumigation in the Caves 2, 3 and 4 having painted surface as well as the repository of stripped panels is being carried out regularly.

Four relief figures of Buddha and his attendants carved in the niches on the right side of the vestibule in Cave 2 were subjected to special repair and restoration.

39. HOSHANG SHAH'S TOMB, MANDU, DISTRICT DHAR.— Removal of microflora and other accretionary deposits on the external marble surface of main central dome and four small domed-turrets at its four corners including the battlements was carried out with the application of dilute ammonical and teepol solution. The work is in progress.

ARCHAEOLOGICAL CHEMISTRY

40. TELI-KA-MANDIR, GWALIOR FORT, GWALIOR, DISTRICT GWALIOR.— Chemical treatment was carried out on the outer surface of the sanctum, facing north wall embellished with unique sculptures and carvings. The work involved the removal of all surface dirt, dust, bird droppings and micro biological growth.

The sculptures of five goddesses and their attendants on the left side of front door-way were consolidated by injecting epoxy resin formulations and finally sealed with retouching paste.

MAHARASHTRA

41. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— Dusting of painted surfaces in all the caves, insecticidal treatment, and diurnal recording of temperature and relative humidity in Caves 1, 2,6,16,17 and 21 were carried out in order to have a general log book of the meteorological parameters within and outside the caves as a continuous effort to study the variation of micro-climate within the caves so that the paintings may be cared by adopting appropriate conservation measures.

Chemical treatment and preservation of painted plaster present on the main Buddha and two standing attendants in the cell of central hall of Cave 6 were carried out.

The removal of stains of bees wax embedded with soot, moss and dust on the facade of Cave 9 was attended to by using selective organic solvents such as solvent naphtha, carbon tetrachloride and chloroform. The entire facade was then chemically cleaned and preserved.

Removal of tenacious accretions of resin coats from the paintings on the ceiling of south aisle in Cave 17 was attended to by using various organic solvents such as morpholine, butyl-lactate, n-butyl amine, cellosolve, etc.

The removal of chalkiness from the paintings in Cave 17 was continued. The work was carried out on the north wall using a combination of various solvents in different proportions as per requirement of the situation.

The work of filleting and fixing of bulged portions of paintings on the ceiling in Cave 19 and the main Buddha shrine of Cave 6 was carried out.

42. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—Red sandstoneja/j's, fountain and stucco work having accretionary deposits of dried moss, dust and dirt were chemically cleaned using aqueous solution of ammonia and non-ionic detergent to restore original beauty and lustre of the structures. Fungicidal treatment and preservative coat were applied on the chemically cleaned surface.

43. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.— Removal of thick hard darkened layer of accretions was continued from the paintings in Cave 16 (*nandi-mandapa*) using various organic solvents in different proportions. The pigment layers due to charring effect at some places did not yield desired results.

In the western shrine of Cave 32, the treatment was continued for the removal of thick and very hard accretions from the paintings using suitable organic solvents. Wherever necessary fixing of pigments and consolidation was carried out.

Stone sculptures in the courtyard and the facade of Cave 32 were consolidated, cleaned, chemically treated with fungicide and finally preserved with polyvinyl acetate solution.

44. KANHERI CAVES, BOMBAY, DISTRICT BOMBAY.— Chemical treatment and preservation work to stone inscription etc. were continued and completed by using aqueous solution of ammonium hydroxide and non-ionic detergent for cleaning purpose while sodium pentachlorophenate and polyvinyl acetate as fungicide and preservative coat respectively.

45. KARLA CAVES, KARLA, DISTRICT PUNE.— Paintings of the main *chaitya* cave, wooden sun-window and wooden umbrella were taken up for chemical treatment. Various suitable organic solvents were used for the cleaning purpose. The work is in progress.

46. AMBERNATH TEMPLE, AMBERNATH, DISTRICT THANE.— Removal of dust, dirt and other accretions like vermilion, etc. from the stone sculptures was continued using aqueous ammonia and teepol solution. Sodium Pentachlorophenate was used as fungicide and the entire cleaned surface was preserved with 2% polyvinyl acetate in toluene.

ORISSA

47. BARAHI TEMPLE, CHAURASHI, DISTRICT PURI.— This temple along with its *jagamohana* covered with thick vegetational growths was subjected to chemical treatment using mixture of dilute ammonium hydroxide and teepol. Zinc-silico-fluoride and polymethyl-methacrylate were used as fungicide and preservative respectively.

48. SUN TEMPLE, KONARAK, DISTRICT PURI.— Eradication of thick cover of dried moss and lichen together with other accretions was continued on the third row of the *pidhas* on the eastern and northern sides, eastern side *vimana* wall of *jagamohana* as well as elephants on the northern side with the help of dilute ammonia-teepol solution. After thorough washing and removal of the reagents, two coats of 1% zinc-silico-fluoride solution were applied as fungicide. The entire area was preserved with 2% polymethyl-methacrylate solution in toluene after the stone surface had completely dried.

49. JAGANNATHA TEMPLE, PURI, DISTRICT PURI.— The exposed de-plastered surface of the *vimana* above 22 m and above 27 m on the western and southern side was subjected to chemical treatment for the removal of the tenacious lime-plaster accretions by physico-chemical means using dilute acetic acid. The cleaned surface was further treated with dilute solution of non-ionic detergent teepol and washed thoroughly to free the stone surface from any residual chemicals. The cleaned surface was then given fungicidal treatment with 1% zinc-silico-fluoride and finally preserved with 1% polymethyl methacrylate solution in toluene. The work is in progress.

RAJASTHAN

50. DEEG PALACE COMPLEX, DEEG, DISTRICT BHARATPUR.— The exterior and interior areas of Suraj Bhavan. facing the east verandah and side corner room having marble surface were subjected to chemical treatment for the removal of iron stains, water marks, dust, dirt, soot and biological growths. The methods and chemical used were based on physical absorption, chemisorption and dissolution mechanism for which clay pack treatment with selective use of additives and reagents was made. Total area of 614 sq metres was completed.

51. FORT, CHITTORGARH, DISTRICT CHITTORGARH.— The chemical treatment on about 510 sq metres of area on the exterior of stone surface of Meera temple was carried out for the removal of micro biological growth and accumulated dust, dirt, etc. The entire area was given fungicidal treatment by spraying 2-3% solution of sodium pentachlorophenate and finally preservative coat was applied on the dried stone surface. The work is in progress.

The chemical treatment of about 420 sq metres area on the exterior of north-east face of Parsvanath temple at Saat-Bees Deori complex was carried out for the removal of the thick growth of dried vegetational growth and lime deposition using mixture of dilute solution of ammonia, teepol and acetic acid respectively. The whole treated area was preserved after fungicidal treatment.

52. MAHISHASURAMARDINI TEMPLE, BAROLI, DISTRICT CHITTORGARH.— Thick hard lime deposition and vegetational growth from the remaining 161 sq metres of stone surface was removed. After applying fungicide, the whole treated surface was preserved with the solution of polymethyl-methacrylate in toluene.

53. JAGAT-SHIROMANI TEMPLE, AMER, DISTRICT JAIPUR.— This temple was taken up for chemical conservation to remove thick growth of moss and lichens, etc. An area of 65 sq metres of stone surface was cleaned during the period under review by gentle brushing by using liquor ammonia and teepol mixture in aqueous medium. The work is to be continued.

54. SHITLESVARA MAHADEO TEMPLE, JHALRAPATAN, DISTRICT JHALAWAD.— Removal of very hard lime-coat, obliterating the carvings and designs of the stone structure was initiated by physico-chemical method after softening the deposits with dilute acetic acid. Mixture of ammonia and teepol solution was used to eradicate the micro-biological growth. An area of 647 sq metres was completed. The remaining work is to be continued.

55. RANTHAMBHOR FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.— Chemical treatment and preservation of arms, weapons, torn royal dresses, etc., were continued by removing dust, harmful patinated accretions and dirt, etc. The work is in progress.

TAMIL NADU

56. JVARAHARESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGAI ANNA.— The *vimana*, *gopuram* of the entrance and sculptures of *nandi-mandapa* were taken up for the removal of thick micro-vegetational growth using ammonia and teepol. Dilute acetic acid was also employed to remove limewash patches. Sodium pentachlorophenate and Acrypol-P were used as fungicide and preservative respectively.

57. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGAI ANNA.— Paper pulp treatment for the removal of soluble salts from the remaining portion of north and west walls of main shrine and north *prakara*-wall was completed. Entire salt free surface was thoroughly washed with distilled water. Santobrite and Acrypol-P were used as fungicide and preservative respectively.

Cleaning of carved sitting bulls, lions, etc. and courtyard at the western entrance was taken up for the removal of ingrained soluble salts and superficial accretions. The work is in progress.

58. NITYAKALYANASVAMY TEMPLE, THIRUVIDANTHAI, DISTRICT CHENGAIANNA. ---- The Sculptures On the walls around the main sanctum and carved granite pillars in the adjoining *mandapa* had accumulated greasy, oily and sooty deposits together with calcarious accretions. Sodium thiosulphate and ammonium carbonate solutions were used along with ammonia and teepol mixtures to get rid of these accretions. An area of 430 sq metres was cleaned and preserved.

An ivory designed palanquin in a very fragile condition was restored by mending and then chemically cleaned to remove the greasy matter and superficial accretionary deposits of dust and dirt. The cleaned surface was finally preserved by applying a coat of 2% solution of poly vinyl acetate in toluene.

59. SRI-PARTHASARATHY-KRISHNA TEMPLE, PARTHIVAPURAM, DISTRICT KANYAKUMARI.— Exposed sculptured wall around the *vimana*, steps and pillars of the *mukha-mandapa* as well as the exterior of Krishna temple were taken up for chemical conservation. Thick micro-vegetational growth, lime-coat and plaster accretions were removed and cleaned. The chemically cleaned stone surface was given applications of fungicide and preservative coats.

The small patchy remains and outlines of paintings on the exterior walls of the *ardha-mandapa* on the north-west side (exposed after deplastering) were subjected to chemical treatment. Apart from this, the hidden remains of beautiful paintings of floral designs, hand portion of a large human figure and a small human figure were brought to light in the interior southwestern ceiling and corner of the *mandapa* by careful use of various organic solvents. Edging and filleting was also carried out wherever required.

60. UTTAMADANESVARA TEMPLE, KEELATHANIYAM, DISTRICT PUDUKKOTTAL.— Patches of lime-wash and micro-vegetational growth were removed by using acetic acid, ammonia and teepol. An area of 501 sq metres was cleaned and preserved. Tree killer was injected into the cracks and holes from where the higher plants were cut.

61. ROCK-CUT SIVA TEMPLE, KUNNAKUDI, DISTRICT RAMANATHAPURAM.— Tarry, sooty and oily accretions were removed from the interior carved and inscribed portions using liquor ammonia and teepol solution. Paintings on stucco figures in the right side of the temple were also cleaned using organic solvents like toluene, acetone, cellosolve, etc. and work of edging, filleting and colour reintegration was also attended to. These paintings were finally preserved by using 1-5% poly vinyl acetate solution in toluene.

UTTAR PRADESH

62. AGRA FORT, AGRA, DISTRICT AGRA.— The marble surface of the inner walls, ceiling and arches of Khas Mahal was covered with thick layers of dust, dirt, soot, greasy matter, etc., thereby imparting a yellowish look. These accretions were removed using liquor ammonia, teepol, hydrogen peroxide, triethanolamine, etc. Thereafter, clay-pack treatment was carried out with bentonite clay admixed with suitable additives to remove sticky deposits. Finally, the surface was washed with distilled water.

63. ITMAD-UD-DAULA, AGRA, DISTRICT AGRA.— The marble surface in the eastern verandah having yellowish appearance due to superficial deposits of dust, dirt and other accretionary deposits was subjected to chemical treatment with successive use of ammonia, teepol and clay-pack methods (pl. LXIXA).

The yellowish old preservative from the painted surface in the adjacent room was removed with mixture of different organic solvents. The painted surface was preserved with very dilute solution of polyvinyl acetate in toluene.

64. TAJ MAHAL, AGRA, DISTRICT AGRA.— Marble surface of the corridor of Sheesh Mahal, the screen around the cenotaph and the staircases leading to the main mausoleum were subjected to chemical treatment to remove the deposited hand grease, grime together with soot and smoke. These accretionary deposits were removed by two stages of treatment. In the first stage, the removal of superficial accretions was carried out by mild scrubbing using mild solvents. The second stage involved the application of paste of bentonite/fuller's earth to remove deep rooted stains. The marble surface was finally washed with distilled water (pl. LXIXB).

65. GUJAR-DEO TEMPLES, ALMORA, DISTRICT ALMORA.— The stone and sculptures of the temple had thick deposits of moss, lichens, algae, apart from dust and dirt. These deposits were removed with suitable mixture of liquid ammonia, teepol in water. Cleaned surface was preserved after fungicidal treatment and complete dryness with PMMA in toluene.

66. KACHERI GROUP OF TEMPLES, DWARHAT, DISTRICT ALMORA.— Sandstone surface of the temples was chemically treated for the removal of micro-vegetational growths using ammonia, teepol in water. 1 % solution of sodium pentachlorophenate was used as fungicide and then preserved with 2% perspex solution in toluene after complete dryness.

67. MONASTERY COMPLEX, KUSHINAGARA, DISTRICT DEORIA.— Thick micro-vegetational growth was removed by gentle scrubbing with 2% aqueous solution of ammonia mixed with non-ionic detergent. To check regrowth of microphytes, fungicidal treatment was given with sodium pentachlorophenate solution followed by consolidation and preserved with 3% solution of acrylic emulsion and 3% solution of polymethyl-methacrylate respectively.

68. RANI MAHAL, JHANSI, DISTRICT JHANSI.— Paintings in Darbar Hall and staircases leading to it were hidden under several thick coats of limewash which were removed by physico-chemical methods. After the paintings were exposed, these were cleaned using organic solvents such as toluene, methanol, butyl-lactate, diacetone alcohol, etc. Finally, these paintings have been preserved with 1% solution of PVA in toluene. The work is to be continued.

69. TOMB OF MURSHID-JADI BEGUM, LUCKNOW, DISTRICT LUCKNOW.— The lime-plastered surface of the monument was covered with thick deposits of moss, lichen and algae together with dust and dirt. After chemical cleaning of these deposits, 1 % solution of sodium pentachlorophenate was used as fungicide followed by application of two coats of 2 to 3% PVA solution in toluene as preservative. The work is to be continued.

70. MULAGANDHAKUTI, SARNATH, DISTRICT VARANASI.— Removal of micro-vegetational growth from the western side wall of the monument and a portion of *Dharmarajika* stupa was carried out with the help of a mixture of 2% ammonia solution and non-ionic detergent teepol. At some places, the selective use of dilute solution of oxalic acid was made to remove the black patches from the stone surface. The chemically treated area was given fungicidal treatment and preserved after complete dryness. The work is to be continued.

WEST BENGAL

71. PRATAPESVARA TEMPLE, KALNA, DISTRICT BARDHAMAN.— Thick layers of moss, lichen, dust, dirt, etc., were chemically removed by scrubbing with soft nylon brush using dilute solution of ammonia-teepol mixture. To check water ingress into the stone surface, a 4% solution of synthetic resin emulsion has been applied on the cleaned area. Dried surface has been preserved after fungicidal treatment.

72. LALJI TEMPLE, KALNA, DISTRICT BARDHAMAN.— Chemical treatment was initiated on this monument to remove the superficial micro-vegetational dust, dirt, accretions by using ammonium hydroxide and non-ionic detergent solution in the required proportion. Sodium pentachlorophenate and polymethyl-methacrylate were used as fungicide and preservatives respectively. The work is to be continued.

TREATMENT AND PRESERVATION OF EXCAVATED AND MUSEUM OBJECTS¹

1. Pages of The Quran belonging to the Archaeological Museum, Bijapur, which had become brittle and also attained yellowish tinge were covered with tissue paper on both the sides after fixing the ink of writing with poly vinyl acetate solution. 1 : 10 mixture of ammonia and hydrogen peroxide (20 vol) diluted with water was applied over the tissue papers. These tissue papers were removed in semi-dried condition. The work is to be continued.

2. Copper objects and coins (one hundred seventy-four) pertaining to Hampi excavation were chemically treated and preserved. The coins were received from Bangalore Circle of the Survey.

3. Six panel paintings, five polychrome sculptures and mural painting of the Archaeological Museum, Velha Goa, were chemically treated

4. Two canvas paintings of the Archaeological Museum, Srirangapatna, were chemically treated and preserved.

5. Twenty-five estampages from Epigraphy Branch of the Survey were deacidified by application of barium hydroxide in methanol to make the paper pliable and strong. Finally these were preserved with polyvinyl acetate in toluene and rolled in plastic jackets for storage.

6. Two copper axes found from Rojdi excavation jointly conducted by the Department of Archaeology, Government of Gujarat and Pennsylvania University, USA, were chemically treated and preserved.

7. A life-size brass sculpture, Paun Raja (pl. LXX), from Jageshvar being smuggled out was seized by the customs and received with right arm broken a little below the shoulder for restoration and conservation work. The broken arm weighing about 7 kg was to be fixed back in proper alignment. The broken arm was restored in its position as per original alignment by securing the iron rod frame work with the help of a conduit galvanised iron pipe using epoxy resin.

¹Information from: 6, Department of Archaeology, Government of Gujarat and the rest from Director (Science) of the Chemical Branch of the Survey.

8. One of the calligraphic manuscripts received from the Taj Museum, Agra, was in bad shape having a number of holes tunneled by the insects and its paper had also acquired yellowish tint indicating the effects of acidity due to the atmospheric action. Besides, the various conservation measures, an improvised method was developed and perfected for filling up holes in the wasli board as well as restoration of the missing portion (pl. LXXII).

9. An ancient silver *chorten* of the Tibetan origin (pl. LXXI), was received from the 4 Sikh Li Regiment, Pithoragarh, for chemical treatment and for removing the dents as well as for fixing and joining the broken parts of the stupa. The *chorten* being of a composite nature containing the metal in conjunction with other materials presented all sorts of problems. The generally recommended method of toughening the silver by annealing before reshaping/removal of dents was not possible. Appropriate conservation and restoration measures were taken after the examination of the nature of all the composite materials used and for reshaping the tools and techniques were improvised.

RESEARCH AND ANALYSIS¹

1. AIR POLLUTION STUDIES AT AGRA.— The monitoring of air pollutants both gaseous and particulates in the vicinity of Agra monuments was continued to have a comprehensive study of various parameters for aerometric surveillance around the Agra monuments. The studies carried out are as below:—

(a) *Sulphur Dioxide*.— The average concentration of sulphur dioxide measured with automatic SO₂ monitor DKK Japan model GRH-72 on hourly pattern was generally observed within the prescribed limit of 30 ug m³. However, during the months of September, 93 and March, 94 the values of average concentration of SO₂ level were observed to be on higher side.

(b) *Dust Fall*.— Monitoring of the dust fall rate at the Taj Mahal, Agra Fort and Sikandara was continued. The said rate was generally measured high probably due to the topography of Agra and being near to the Thar desert. The analytical studies showed the dust having significant amounts of soluble salts.

(c) *Sulphation Rate*.— The sulphation rate measurements are useful as supplementary to the sulphur dioxide data. This technique is simple and inexpensive to determine the average sulphurdioxide concentration over longer periods.

(d) *Suspended Particulate Matter*.— The finer dust particles which do not settle under the influence of gravity and remain airborne for longer periods get deposited on the stone surface by impinging. These particles are harmful to the monuments due to their sticking power on the stone surface. At the Taj Mahal, the maximum average of SPM was always found to be much higher than the prescribed limit of 100 ug/m³ for sensitive zone indicating thereby the ambient air of Agra is polluted with finer dust condensed with gaseous pollutants.

(e) *Rainwater Analyses*.— Analyses of rainwater provides vital clue about the nature of the pollutants present in atmosphere. The analytical data showed acidic character of the rainwater as well as appreciable amount of the soluble salts.

¹Information from: Chemical Branch of the Survey.

(f) *Meteorological Parameters.*— The measurements of meteorological parameters like temperature, relative humidity, etc., were carried out in the vicinity of the Taj Mahal, Agra. It concludes wide variation of temperature and relative humidity as below:-

Summer	Temp	16° C-47° C	RH	10%	-	78%
Rains	Temp	25° C-42° C	RH	21%	-	100%
Winter	Temp	8° C-39° C	RH	28%	-	96%

(g). *Wind Parameters at Agra.*— At Agra, generally, the winds are experienced from all directions. The data in respect of wind directions monitored in terms of per cent for four components for the year 1993-94 is as follows:

Direction	Apr.93	May.93	Jun.93	Jul.93	Aug.93	Sep.93	Oct.93	Nov. 93	Dec. 93	Jan. 94	Feb. 94	Mar.94
NE	12.5	21.9	61.8	28.4	28.1	58.1	17.5	21.6	31.6	20.9	12.3	4.1
NW	53.5	50.4	33.9	37.8	43.7	13.5	49.2	70.7	56.0	42.6	59.5	75.8
SE	25.0	4.5	3.25	4.1	17.2	24.25	14.6	1.5	9.3	30.6	18.6	4.0
SW	9.0	23.1	4.0	29.7	17.2	3.8	18.6	6.1	9.2	4.8	9.5	16.1

2. *Monitoring of Atmospheric Pollutants in Red Fort Complex, Delhi.*— The monitoring of atmospheric pollutants in the Red Fort complex was continued this year also. Apparatus like dust fall collector. Lead Candle Chamber were installed on the terrace of Mumtaz Mahal on the northeastern corner of the complex which is proximate to sources of pollution like vehicular traffic on the Ring Road, thermal power station, etc. Apart from this, to study the SPM in the atmosphere in Red Fort complex, a High Volume Sampler was operated and the data collected once in a week in the vicinity of Mumtaz Mahal, Delhi.

The data thus collected confirm that the area within the vicinity of Red Fort complex towards Ring Road is highly polluted and the structures are exposed to air pollutants having finer SPM condensed with other gaseous pollutants.

3. *Study of Material Heritage.*— (i) The marble samples were analysed to find out their chemical composition with special attention to light and dark streaks.

(ii) Two lime-plaster samples from Ram Nagar (Jammu and Kashmir), one sample each from Sadar Manzil, Bhopal (Madhya Pradesh), the plaster from Ibrahim Tomb. Narnaul (Haryana), Patiala (Punjab), from Raza Library, Rampur (Uttar Pradesh), three samples from Khirki Tomb, Khirki and Buhlul Lodi's tomb and as many lime-plaster samples from the outer verandah, Lodi garden (Delhi) were analysed for their chemical composition and physical properties.

(iii) A stone sample belonging to Grishneshvara temple, Ellora (Maharashtra), has been analysed to find out its chemical composition.

(iv) Quantitative analyses of brass and corroded iron rod inside the hollow arm of the sculpture received from Jageshvar (Himachal Pradesh) were carried out by instrumentation as well as conventional methods.

(v) Analyses of polybond A-104, a polymer and white cement used for grouting of the Jagannatha temple, Puri (Orissa), has been in progress.

(vi) Chemical analyses of polishing stone for marble was conducted.

(vii) Infra Red Spectrophotometric analyses of certain preservatives have been carried out towards their utility for stone preservation.

(viii) Analyses of different layers of paintings from Shey Palace, Leh, are in progress.

(ix) A sandstone sample from the Shore temple, Mahabalipuram (Tamil Nadu), and Cambodia have been analysed.

(x) Samples from Quwwatu' l-Islam mosque and Imam Zamin, Qutb complex, New Delhi, were also analysed to ascertain their chemical composition.

(xi) A sample of bat's excreta from the Khirki mosque. Khirki (New Delhi), has also been analysed to find out its chemical nature.

(xii) Accretions of black inlay stones of Itmad-ud-Daula and glazes from Chini-ka-Rauza. Agra (Uttar Pradesh), have also been analysed.

4. Bio-deterioration of Cave Paintings due to Bat's Excrement.— Even after the extermination of the bats from the Ajanta Caves, the disfigurement and decay of the murals continue to take place especially near the areas where the urine has penetrated deep into the mud plaster and stone surface. The accumulation of excretory deposits have been so heavy that, under the damp conditions, some of its constituents have migrated over large areas of the painting much like a phenomenon resembling to chromatographic process. In the present studies, five samples were collected from different caves both from the dark black deposition as well as white patches where the constituents of the excreta have migrated. The studies show that the white patches are mainly formed due to the migration of water soluble constituents, mainly identified to be urea, salts of phosphate, sulphate and possibly salt of a carboxylic acid. The black patches which are rich in organic matter provide a good substratum for the micro-biological growth thereby aggravating the bio-deterioration of the cave paintings. The slow decomposition of urea, an important constituent of bat's urine, creates favourable conditions for insect activity and organic matter in the black deposits and acts as good nutrient.

5. Characteristics of Accretionary Deposits on Stone Surface Structures due to Change in Environmental Scenario Around the Monuments.— Studies regarding the characteristics of the particulate matter deposited on the stone surface of different structures in Red Fort, Delhi, have been carried out. The particulate matter collected from different locations from the various structures inside Red Fort, Delhi, has been found to be contaminated with water soluble salts which, if not removed, would have deleterious effect on the stone and marble surface. It is observed that the structures within the Red Fort on the bluff which used to receive cool breeze from the river Yamuna are now exposed to the contaminated dusty winds which deposit the particulate matter on the structures. It is exclusively due to the change in environmental scenario.

XI. ARCHAEOLOGICAL GARDENS¹

GOA

1. OLD CHURCH COMPLEX, OLD GOA.— The Central Public Works Department was assigned the work of constructing a new dug-well.

KARNATAKA

2. ROYAL COMPLEX, HAMPI, DISTRICT BELLARY.— The water supply system was introduced by sinking a bore-well.

3. WATER PAVILION, KUMATAGI, DISTRICT BIJAPUR.— The work of developing a garden was taken up.

4. MALLIKARJUNA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— The work of laying out a garden in the additional area around the temple is in progress.

5. KEDARESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— The water supply system was initiated - by sinking a bore-well.

6. LAKSHMI-NARAYANA TEMPLE, HOSAHOLALU, DISTRICT MANDYA.— For supply of water a bore-well was excavated.

MAHARASHTRA

7. DAULATABAD FORT, DAULATABAD, DISTRICT AURANGABAD.— The work of landscaping and garden-development is in progress.

TAMIL NADU

8. FORT. VELLORE, DISTRICT NORTH ARCOT AMBEDKAR.— A garden was developed around the area handed over by the Municipal Corporation.

UTTAR PRADESH

9. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.— The cleaning and levelling of the land at the newly-acquired area was completed and hedge-planting along the chain-link fencing is in progress.

10. FATEHPUR SIKRI, DISTRICT AGRA.— The work of boring below the Dak Bangalow was completed besides finalising arrangement for electricity from the Uttar Pradesh State Electricity Board.

¹Information from: Horticulture Branch of the Survey.

ARCHAEOLOGICAL GARDENS

11. ROMAN CATHOLIC CHURCH, KEYDGUNJ, DISTRICT ALLAHABAD.— The work of laying pipeline for irrigation was undertaken for garden development.

12. CHAUKHANDI STUPA, SARNATH, DISTRICT VARANASI.— The arrangement for a deep bore-well and installation of a submersible pump are in progress as the existing well of ancient times is beyond repairs for emitting poisonous gas.

WEST BENGAL

13. ADINA MOSQUE, PANDUA, DISTRICT MALDA.— The work of boring a tube-well was initiated.

XII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

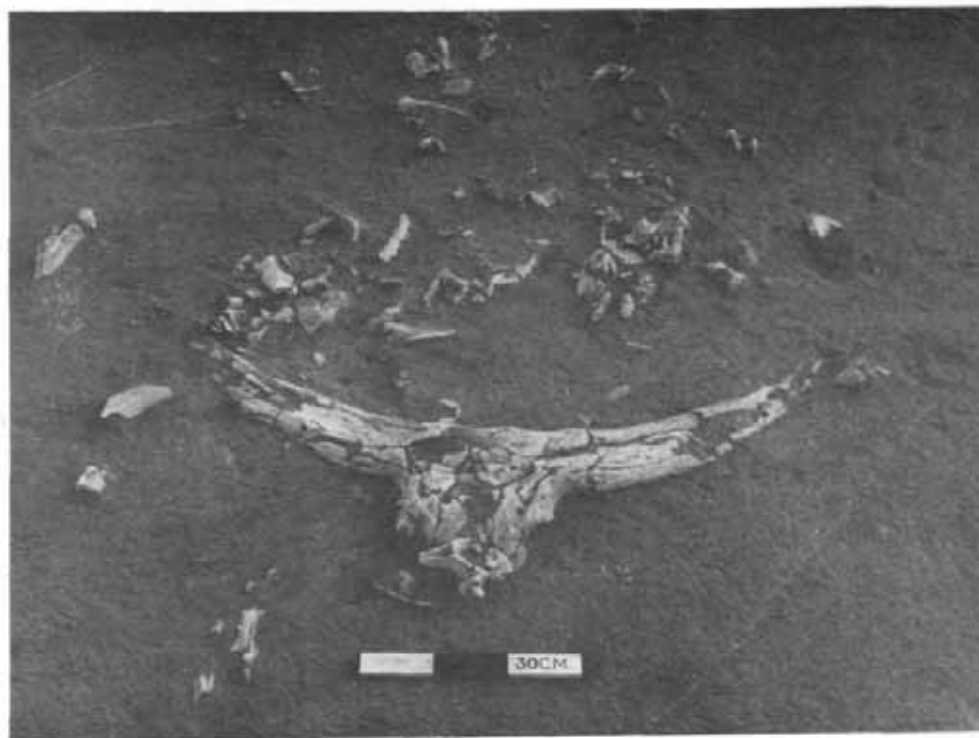
1. INDIAN ARCHAEOLOGY- A REVIEW.— The issue for the year 1988-89 was published and the issue for the year 1989-90 was made press-ready. One issue for the year 1953-54 was reprinted.

2. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—Number 89, *Excavations at Bhagwanpura* by Jagat Pati Joshi was brought out.

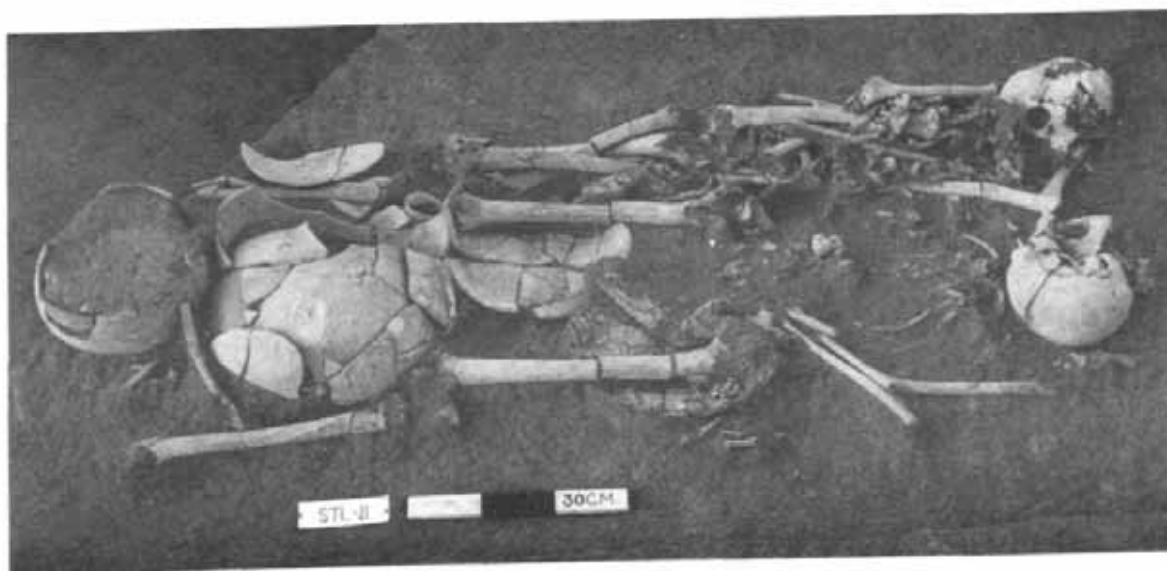
3. ANNUAL REPORT ON INDIAN EPIGRAPHY.— Issue for the year 1984-85 was brought out.

OTHER PUBLICATIONS

Karnataka: The Department of Archaeology and Museums, Government of Karnataka, brought out *Narrative Panels from Kadur; Arms and Armoury of the Mysore Palace; Catalogue of Mysore Palace Caskets and A Cultural Study of Kalyana Chalukyas from the Epigraphical Background in Kannada.*

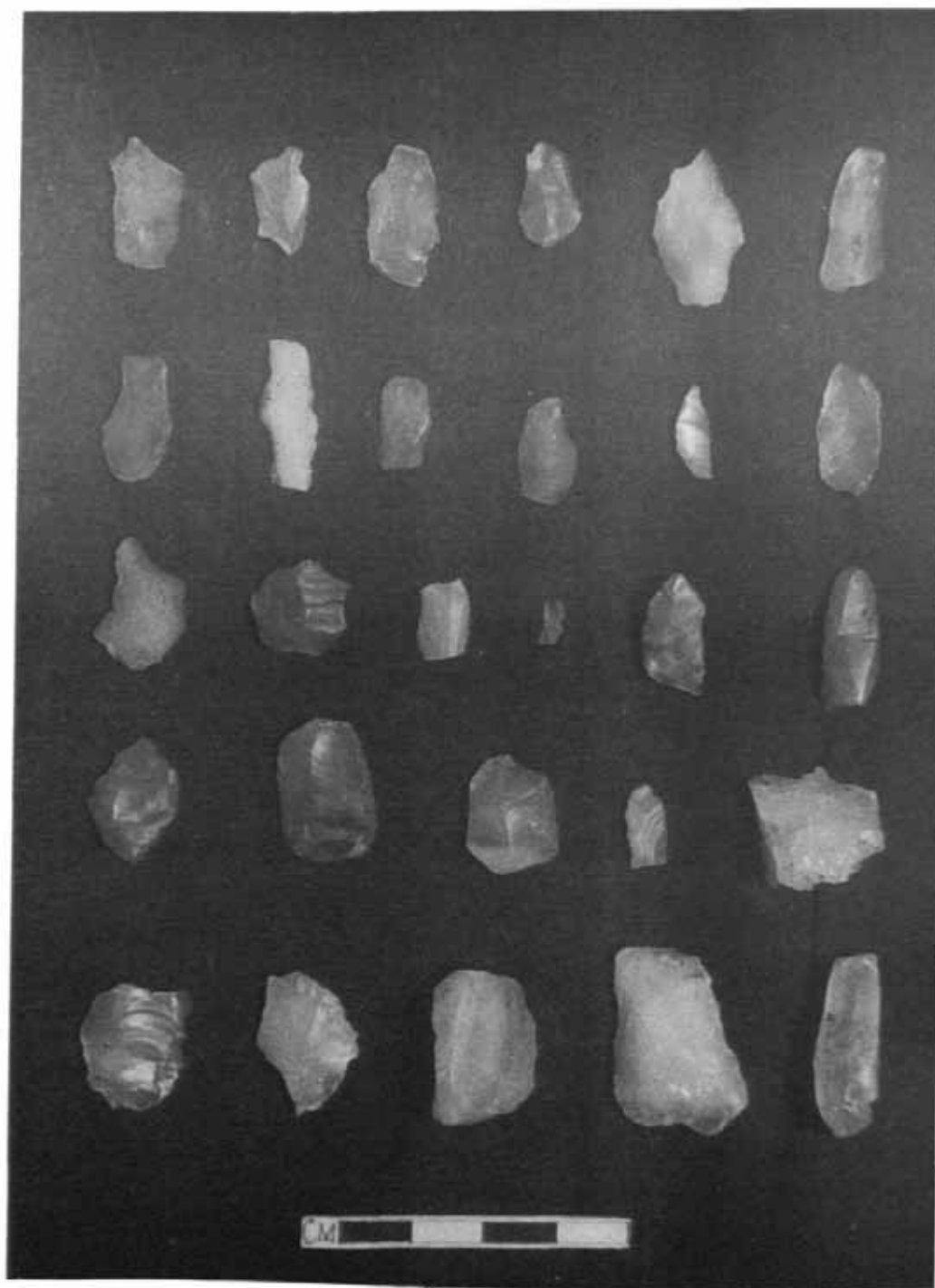


A



B

Santhli : A, skull of a wild cattle; B, double-burial. See p. 27



Jher, Kodada, Devdi and Turkhera : microliths. See p. 34



A



B

Padri : A, an early Harappan structural complex; B, Hap : circular bastion at south - east corner of fortification. See pp. 35 and 40



A

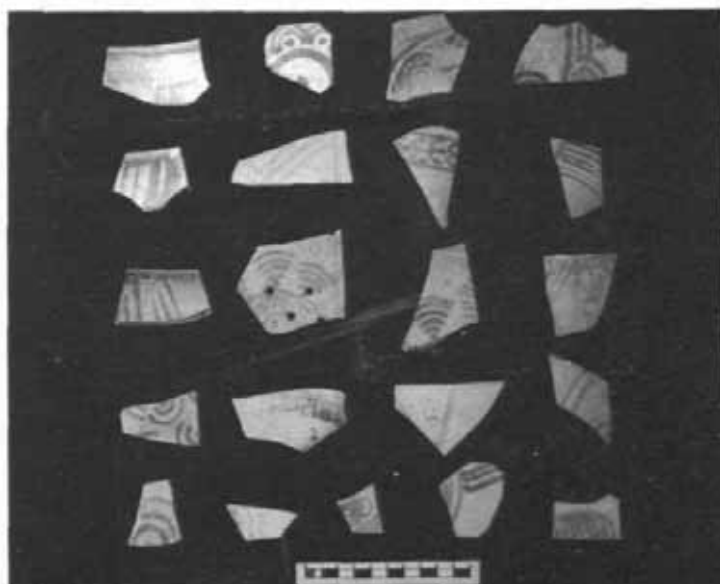


B

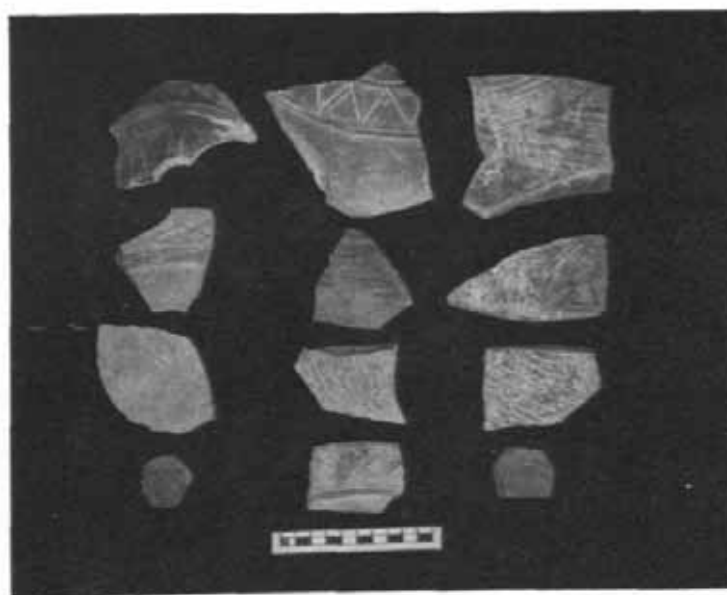


C

Sataura : A, PGW shapes; B-C, Shergarh : circular terracotta medallion, Kushan period. See p. 47



A

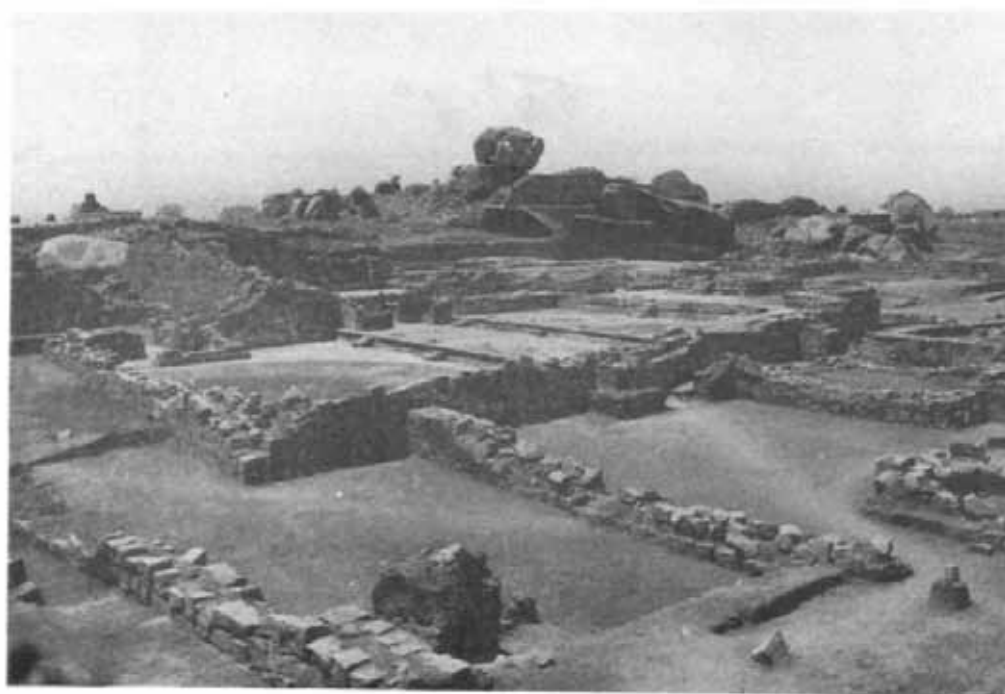


B

Ghaggar river : Harappan, PGW and early historical pottery types. See p. 45



A



B

Hampi: rock-cut temple area, A, before and B, after removal of baulk. See p. 54



A



B

Hampi: terraced-structure, A, before and B, after excavation. See p. 55



A



B

Hampi : northern entrance to Rang Mahal, A, before and B, after excavation. See p. 56



A



B

A, Kukkundur : general view; B, Badaga Kajekaru : urn-burial. See pp. 62 and 63



A

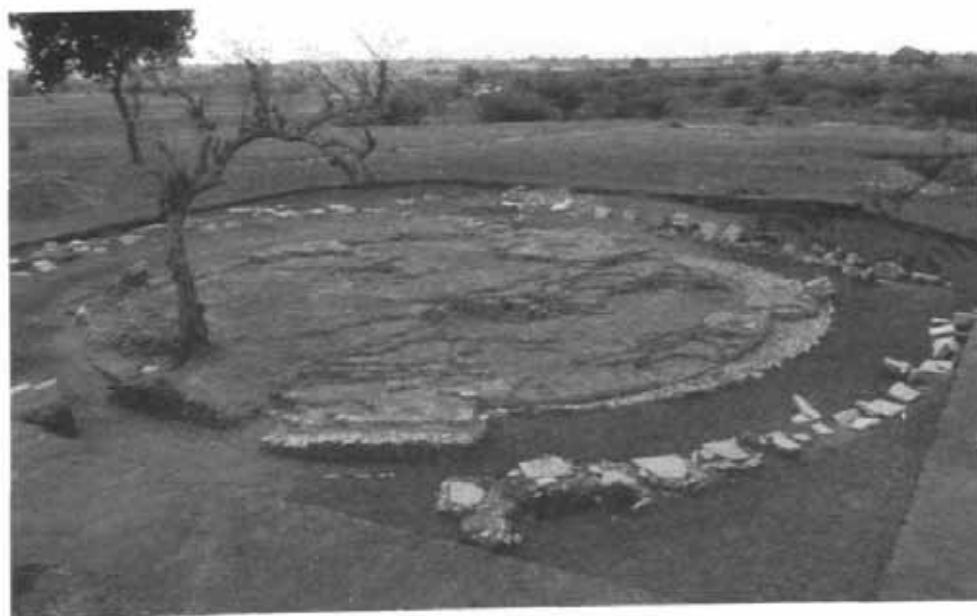


B

Hasargundigi : A, sculptured upright; B, sculptured panel of the drum. See p. 66



A



B

Hasargundigi : stupa, during and after excavation. See p. 66



A



B

Gudnapur : A, exposed palace-complex; B, temple north of the palace. See p. 67

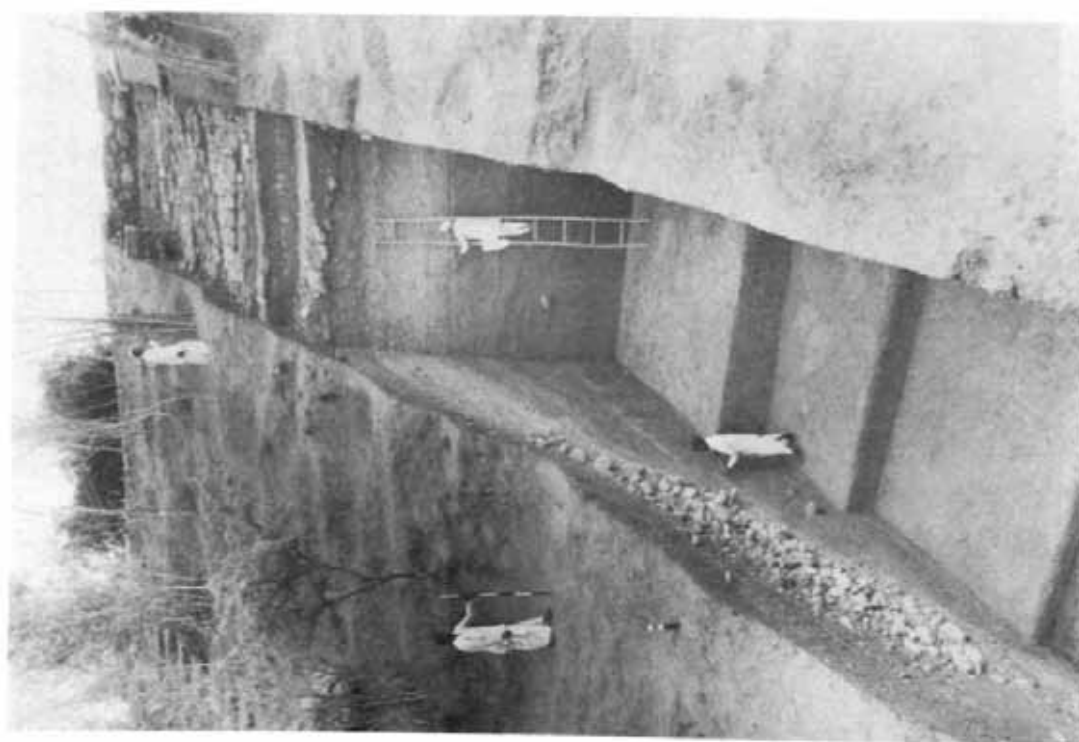


A

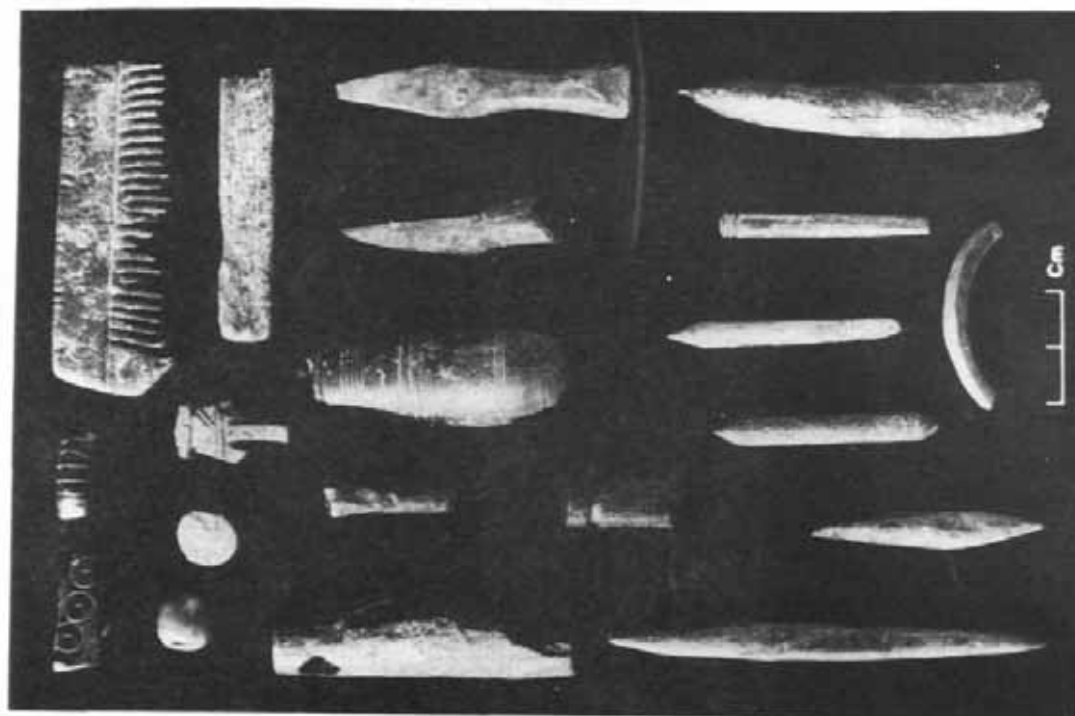


B

A, Sanchi : iron objects; B, Satdhara : apsidal structure. See pp. 71 and 72



4



B

Pauni : A, cutting across the rampart (PNI-2); B, ivory and bone objects. See p. 77

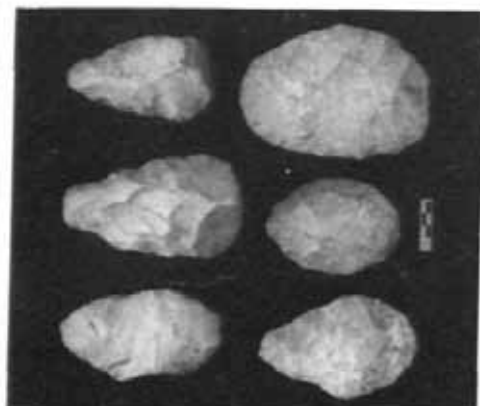


A

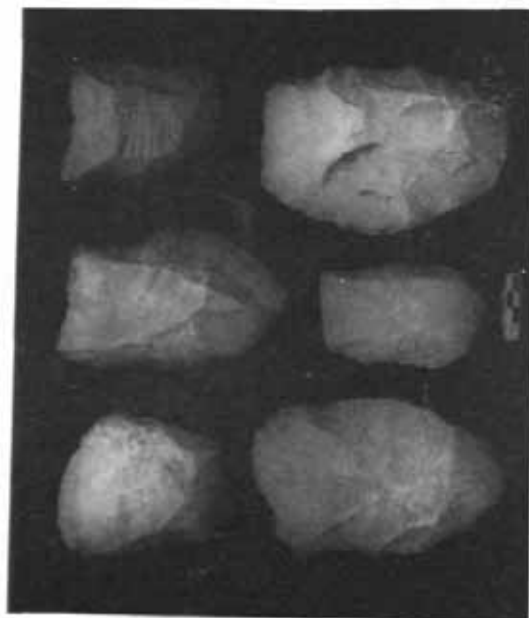


B

Pauni : A, circular stone platform; B, terracotta human figurines. See p. 77



A



B

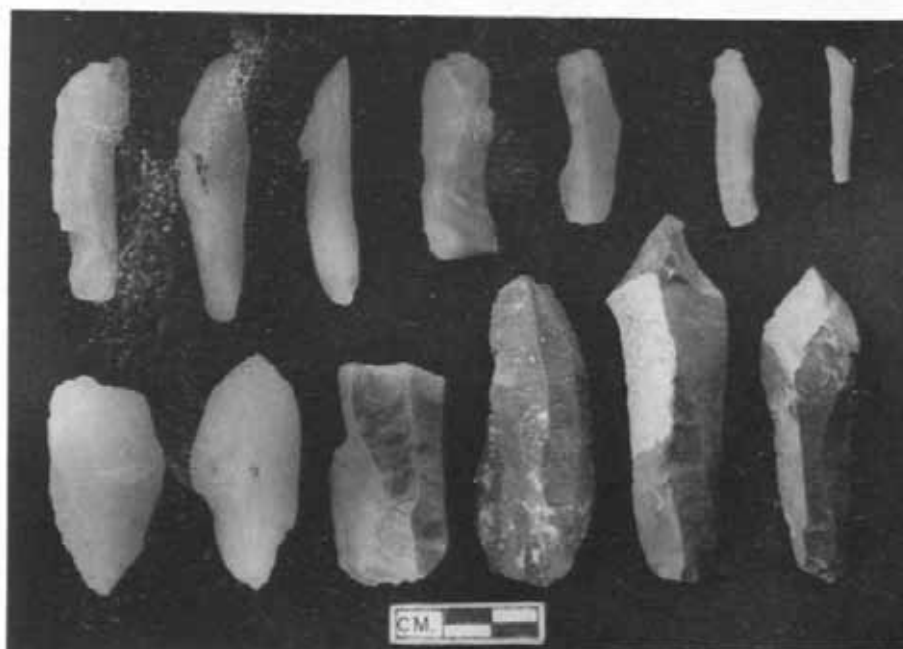


C

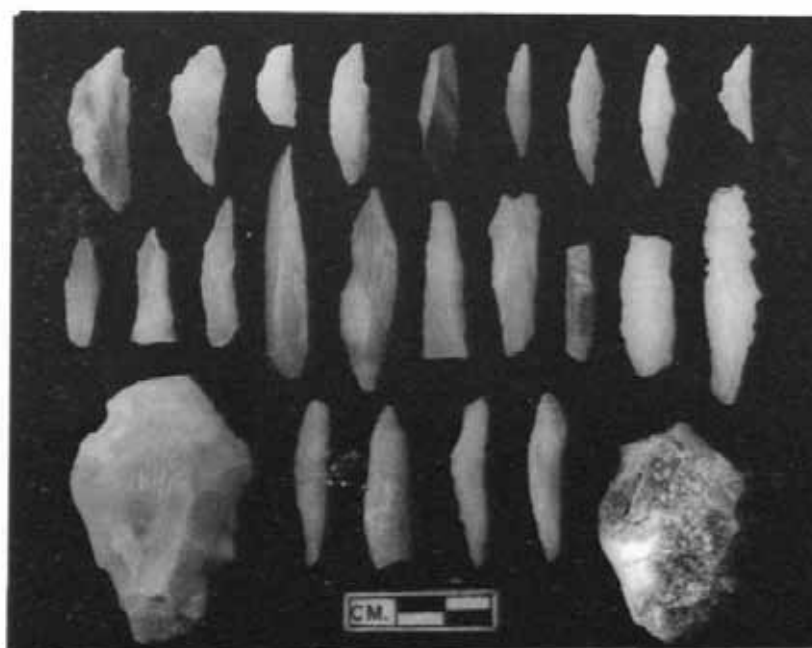


D

Papuniya Tekdi : A, handaxes; B, cleavers; C, poulder; D, silicified wood. See pp. 78 and 79.

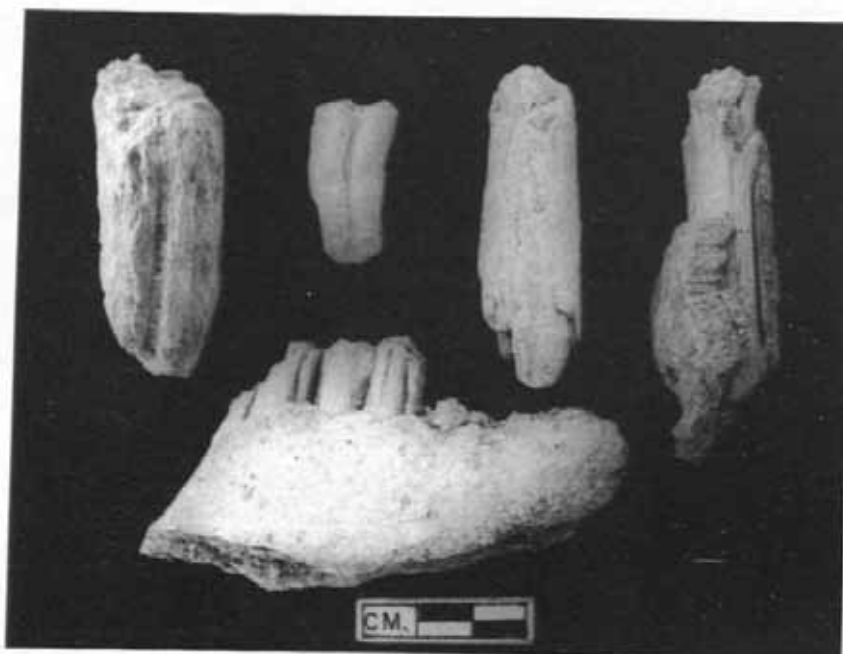


A

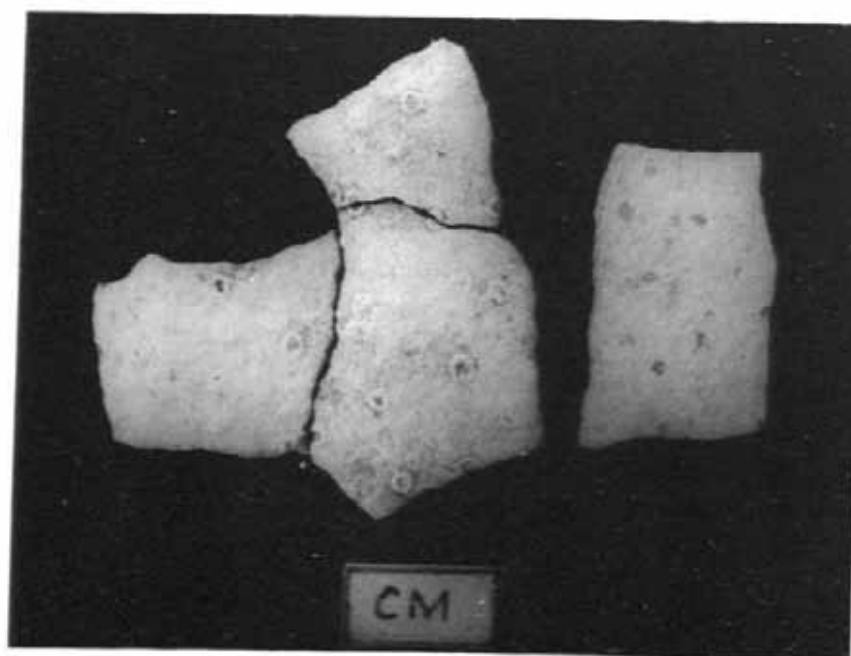


B

Ellora : Upper-Palaeolithic artefacts. See p. 79

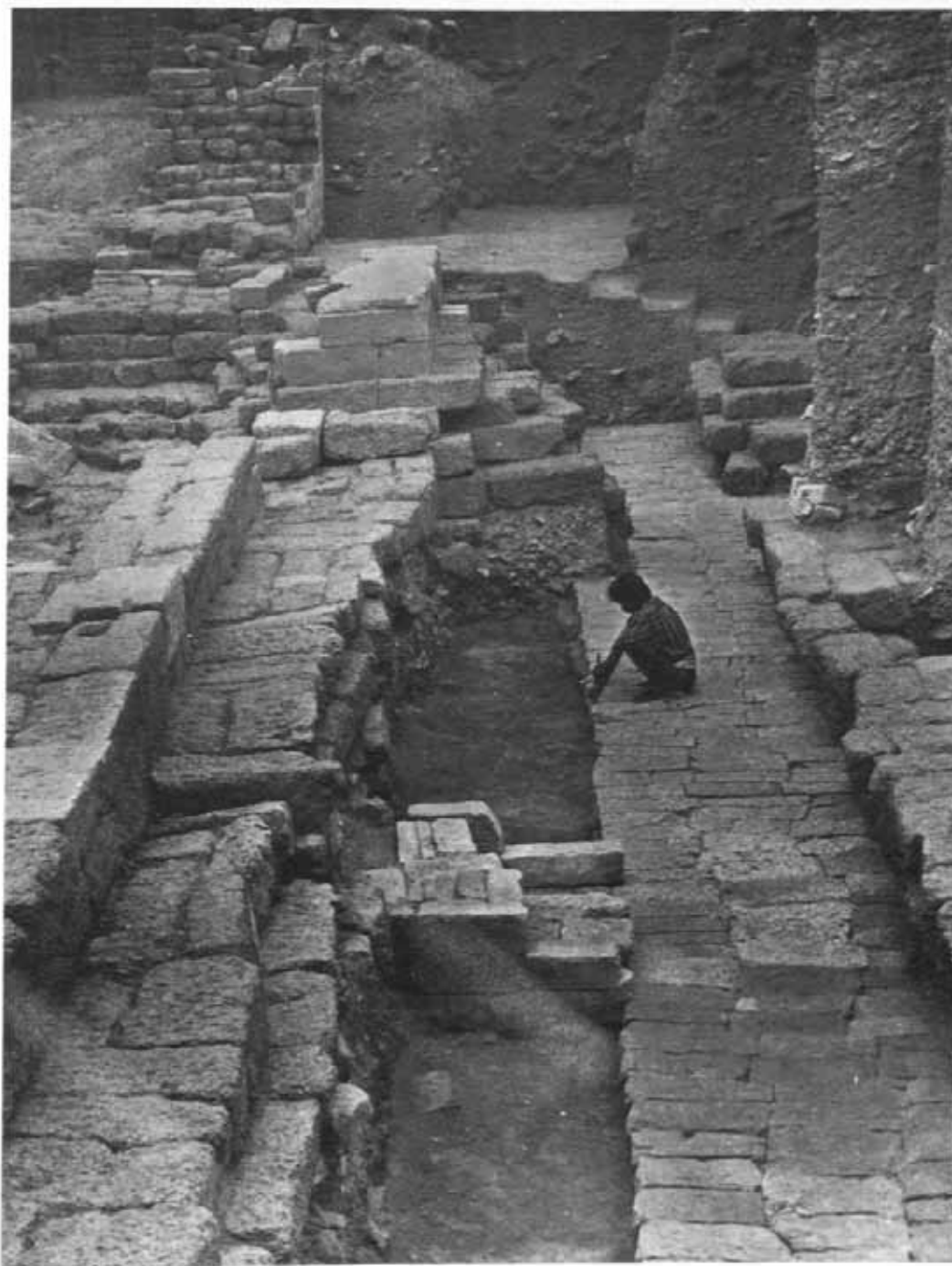


A

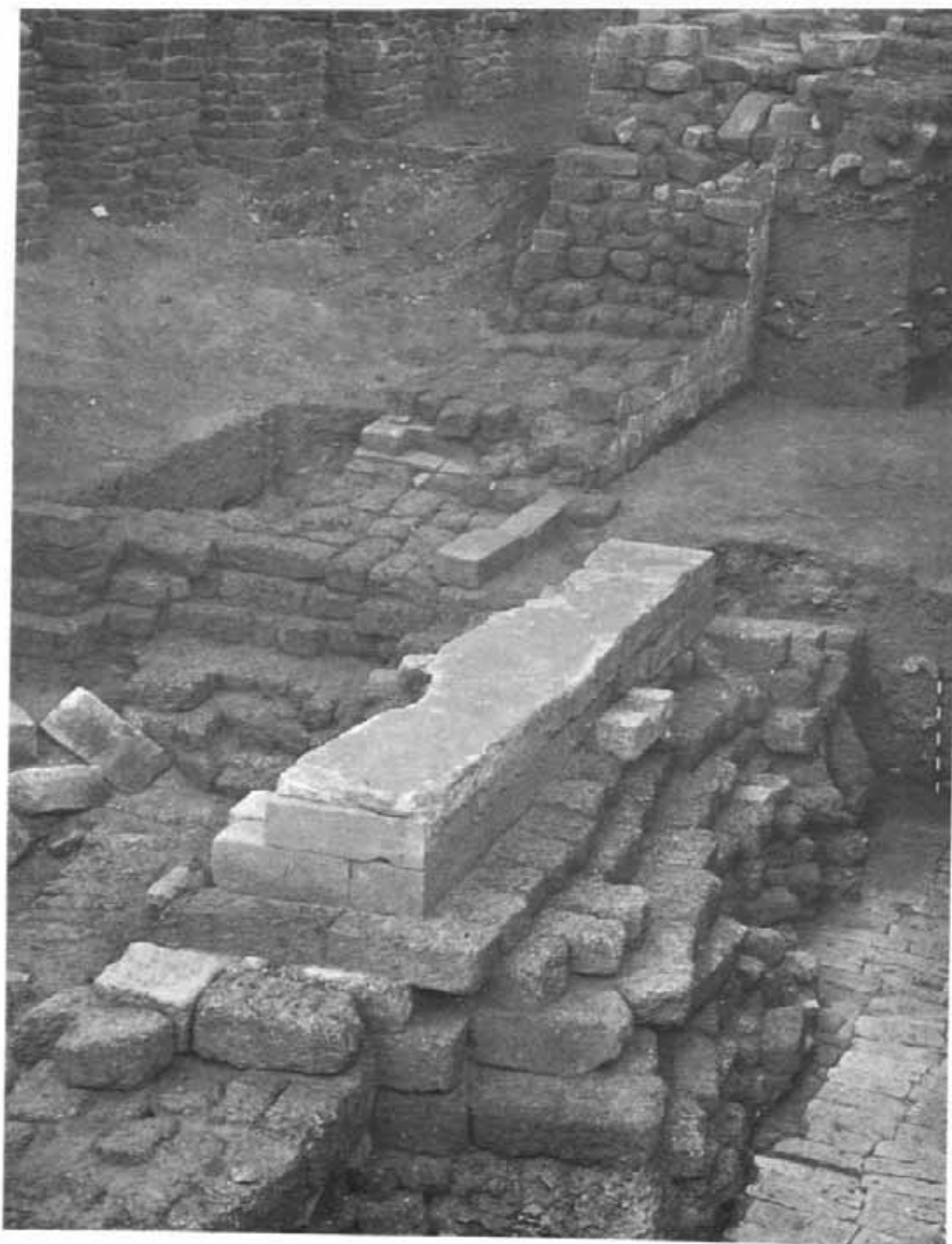


B

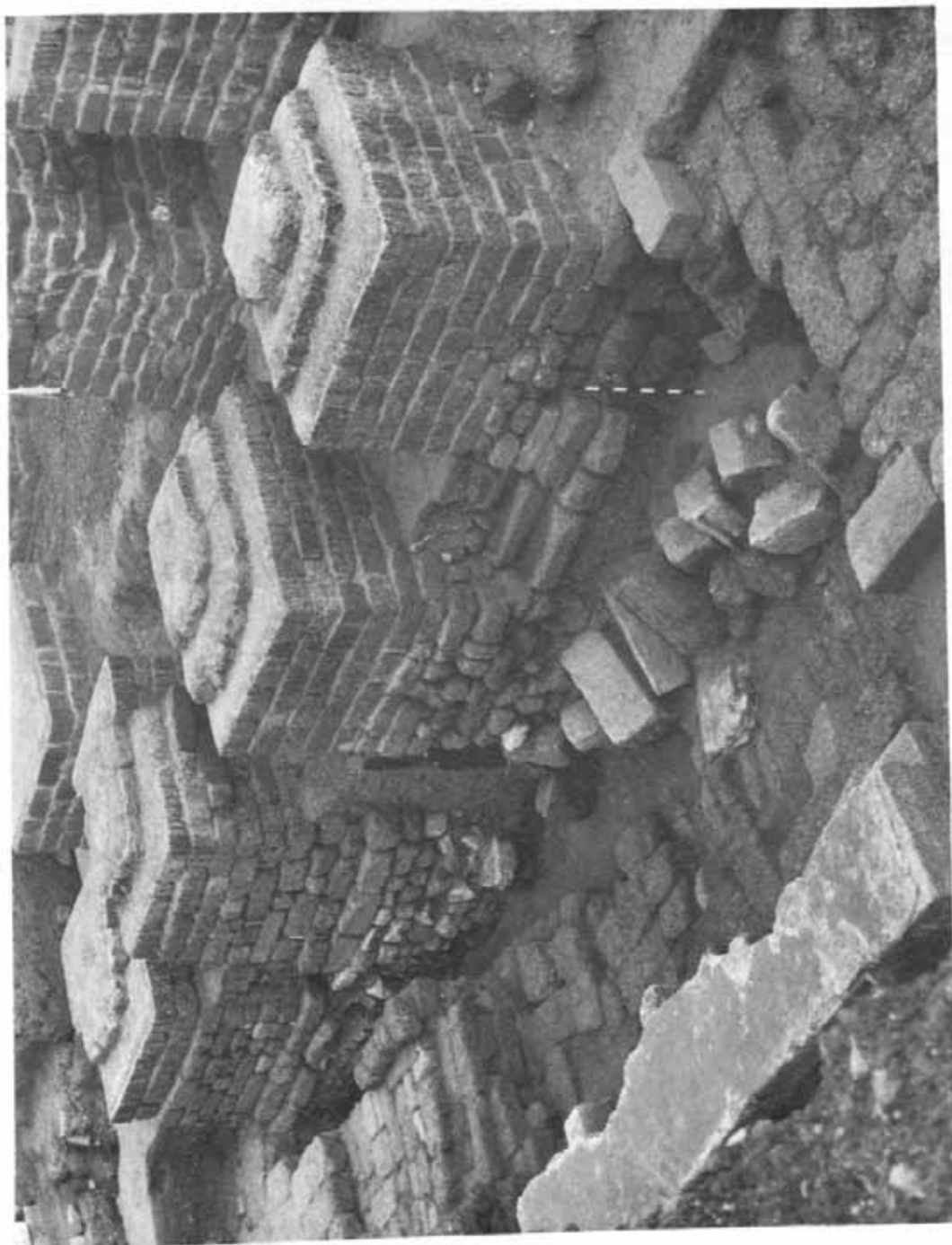
Ellora : A, faunal remains; B, ostrich egg-shell pieces. See p. 79



Barabati fort : stone-pavement (Period I) and plastered-wall with a step (Period II). See p. 85



Barabati fort : plastered-wall with a step and drain hole. See p. 87



Barabati fort : foundation columns over the structures of Period II. See p. 87



A



B



C

Barabati fort : A - B, female sculptures; C, decorative stone-pillar. See p. 88



Barabati fort : southern retaining-wall with ramp and step in the foreground. See p. 88



A



B



C

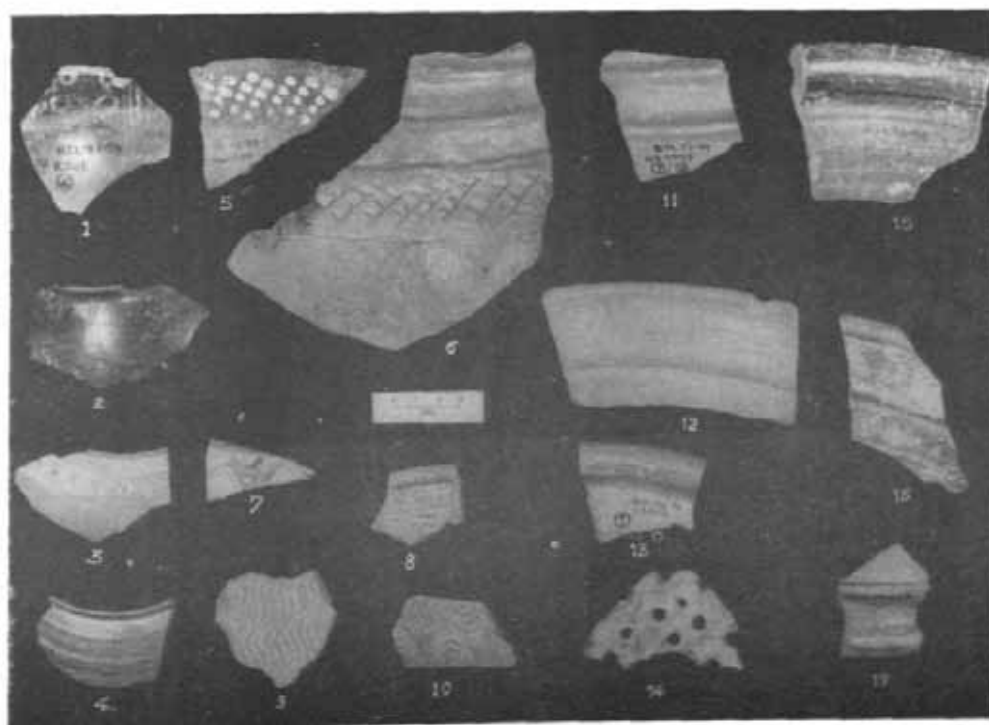
Barabati fort : A, female heads; B, copper and C, potin coins. See p. 88



A

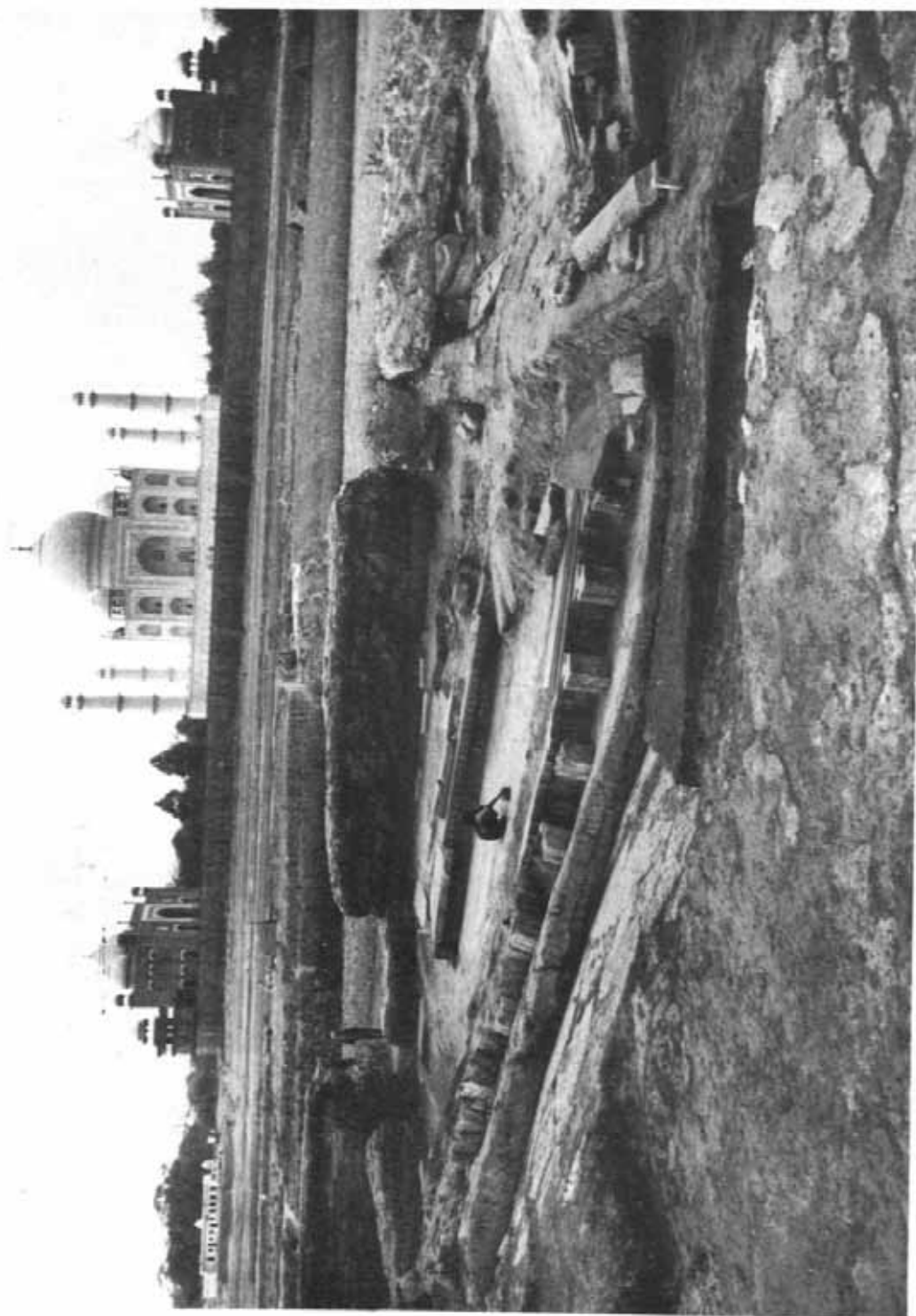


B



C

Balathal : A, ring-well; B, cloth piece and C, shapes and designs of chalcolithic pottery. See pp. 95-97



Agra, Mehrauli bagh : sunken southern portion of octagonal water tank and southern pavilion. See p. 100



A



B

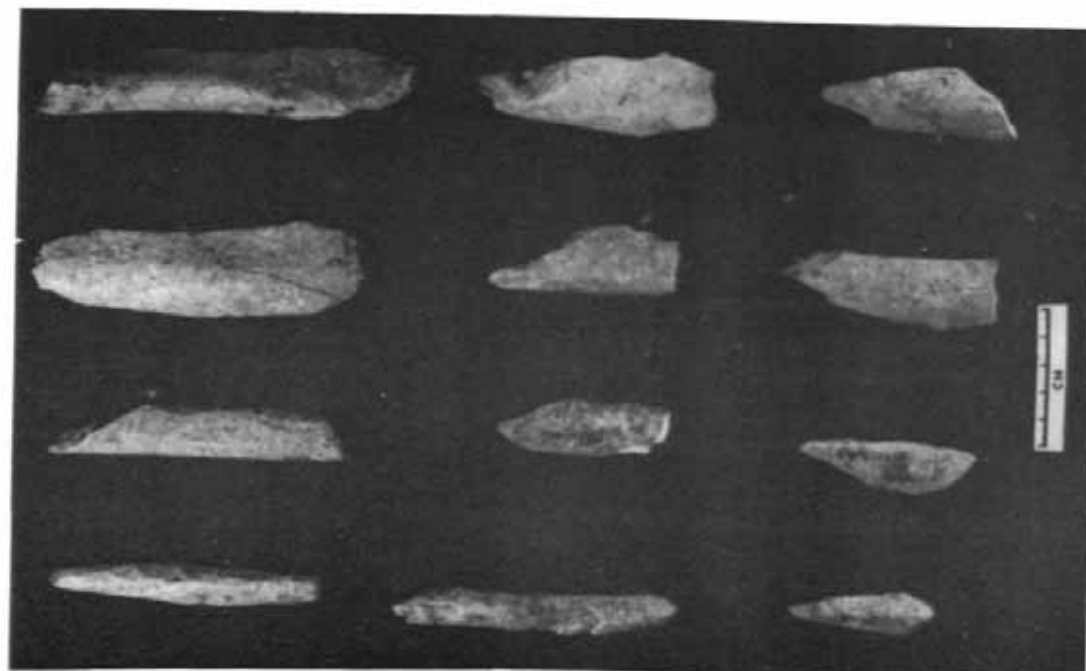
Sunana : A, exposed cist-burial; B, Cist-5 (SNA-3). See pp. 103-104



B



C



A

Dihar : A, bone tools; B, channel-spouted bowl and C, terracotta humped - bull. See p. 121



A



B

A, Pachegaon : inscription of Farrukh Siyar; B, Pratappur : inscription of Aurangzeb. See pp. 129 and 131



A



B

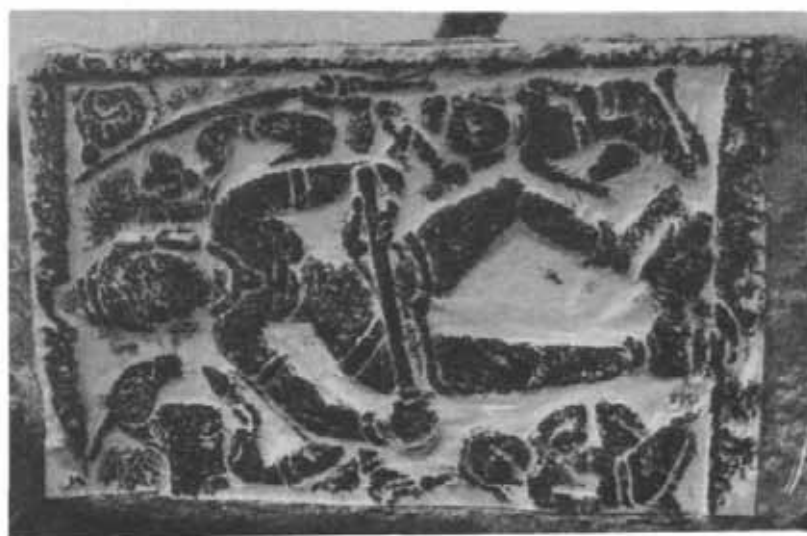


C



D

Raiganj : A, Uma-Mahesvara; B, Yamuna; C, Siva and D, Chamunda. See p. 134



C

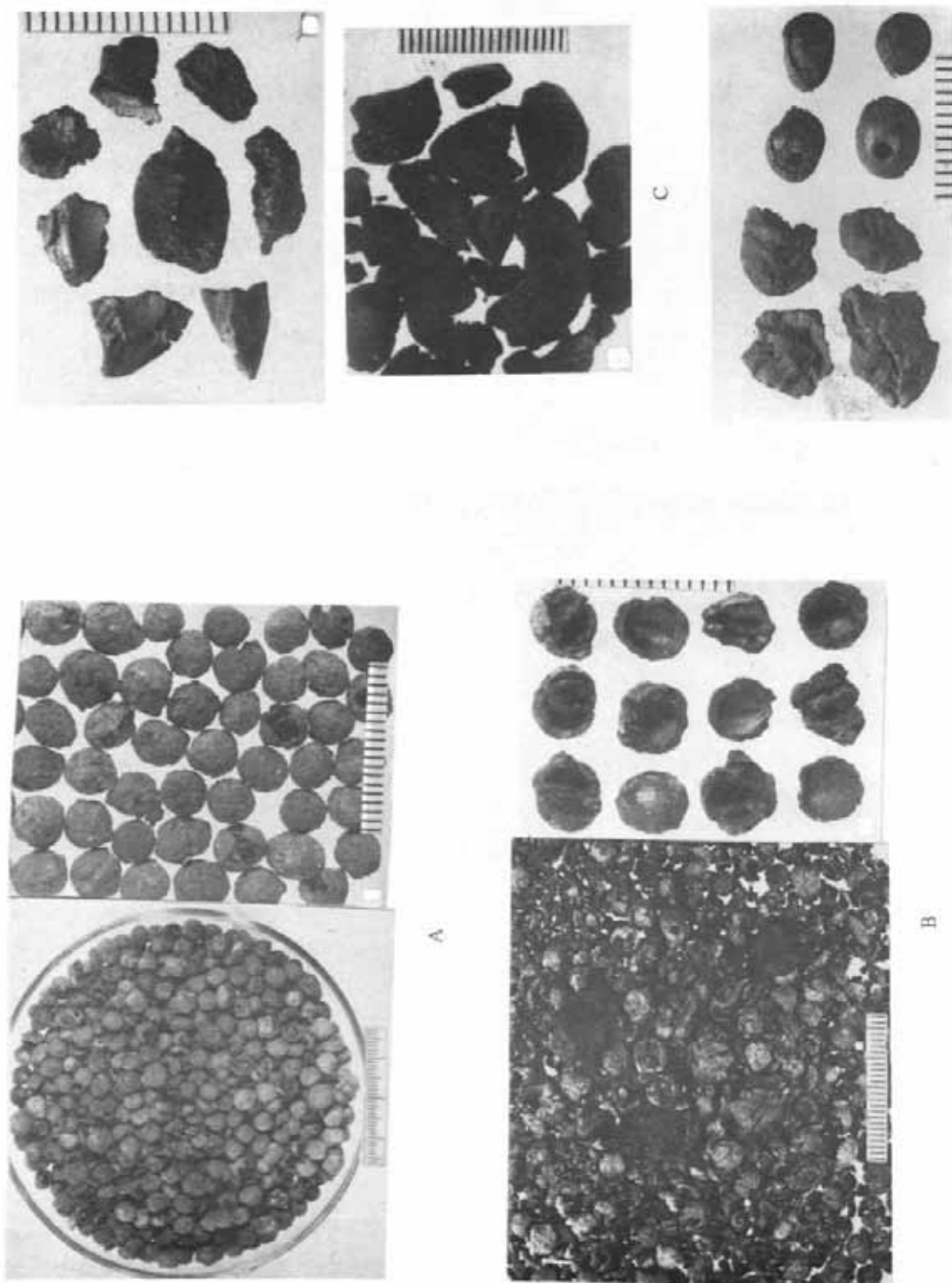


B

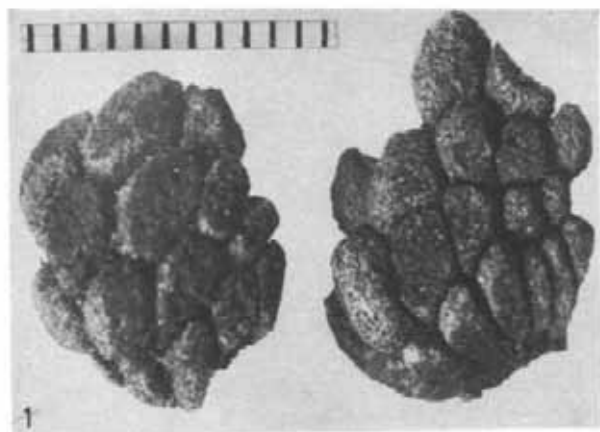


A

Raiganj : A, Vishnu; B, dancing Ganesa; and C, Singapuram: Durga. See pp. 134 and 138



Banawali: A, south - Indian *sopmat/reetha*; B, carbonized sample of shampoo; C, remains of anwala/emblic fruits; D, shikakai - remains of pod and seeds. See pp. 143-144



A



B



C



D



E



F



G



H



I

Sanghol : A, custard - apple (*annona squamosa*); B, coriander (*coraindrum sativum*); C, almond (*prunus amygdalus*); D, black-pepper (*piper nigrum*); E, cumin (*cuminum cyminum*); F, south Indian soapnut (*sapindus* cf. *emarginatus*); G, walnut (*juglans regia*); H, jambolana (*syzygium cumini*); I, *Chebulie-myrabolan*/Haritaki (*terminalia chebula*). See pp. 144-145.



A



B

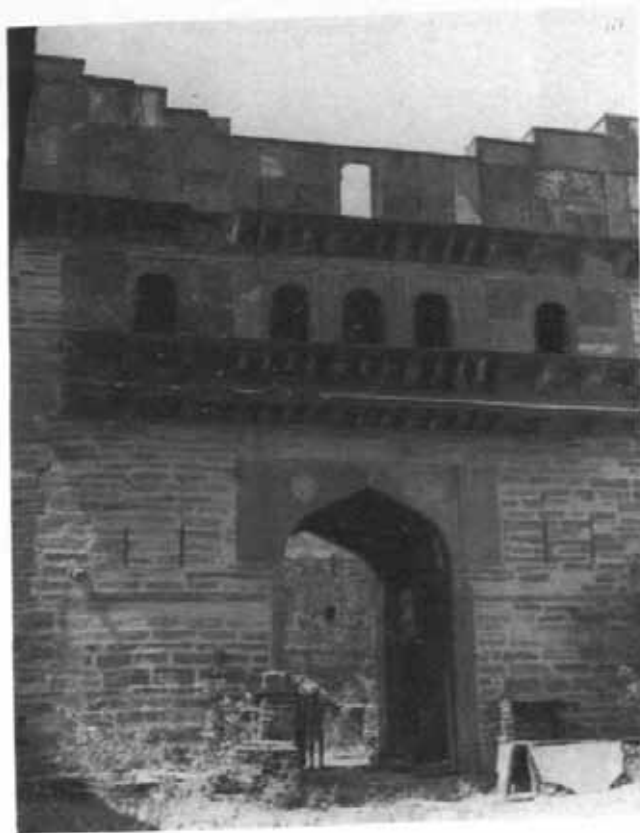


C

Salar Jung Museum : A, Dasavatara in ivory; B, Quran Sharif, Qutub Shahi period; and C, Mathura Museum: standing Vishnu. See pp. 148-150



A

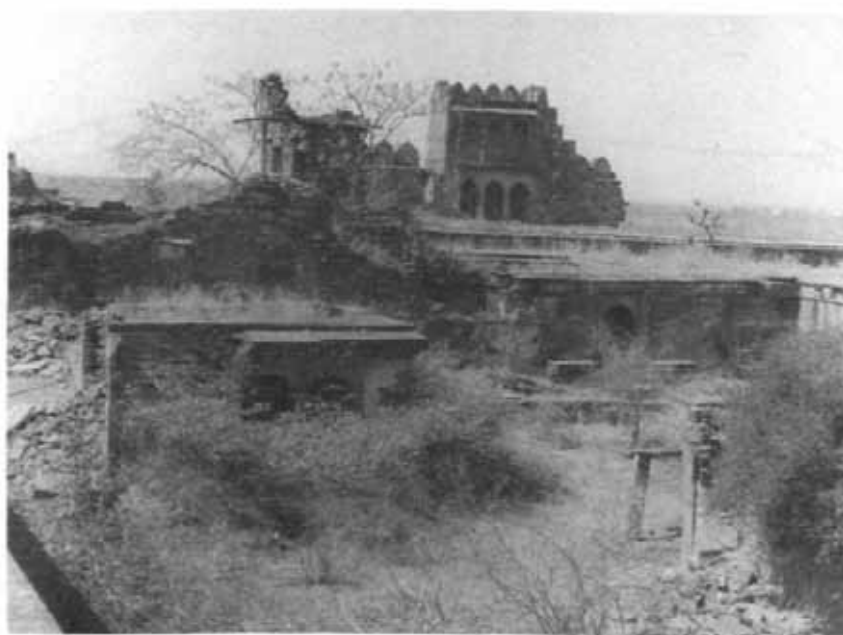


B

Dev Hansa Garh : A, outside view of the stone-built fort-wall; B, outside view of inner gateway. See p. 152

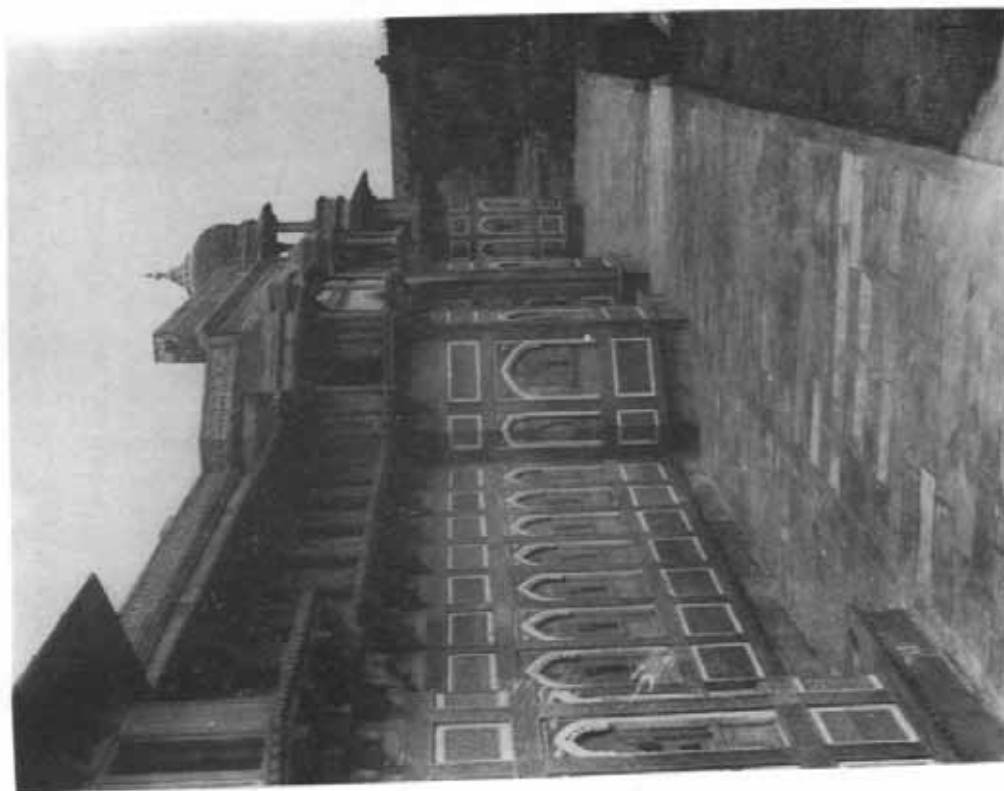


A

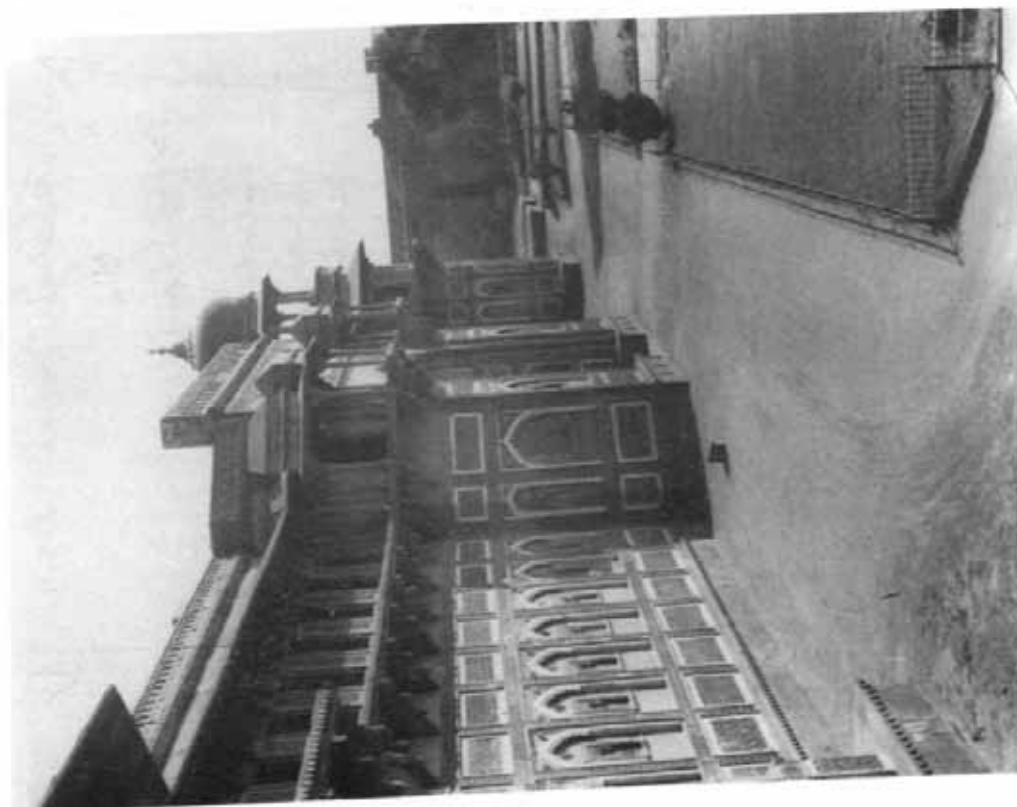


B

Dev Hansa Garh : A, top view of western wing of Rani Mahal from south - east; B, front view of Rani Mahal from north - east. See p. 154

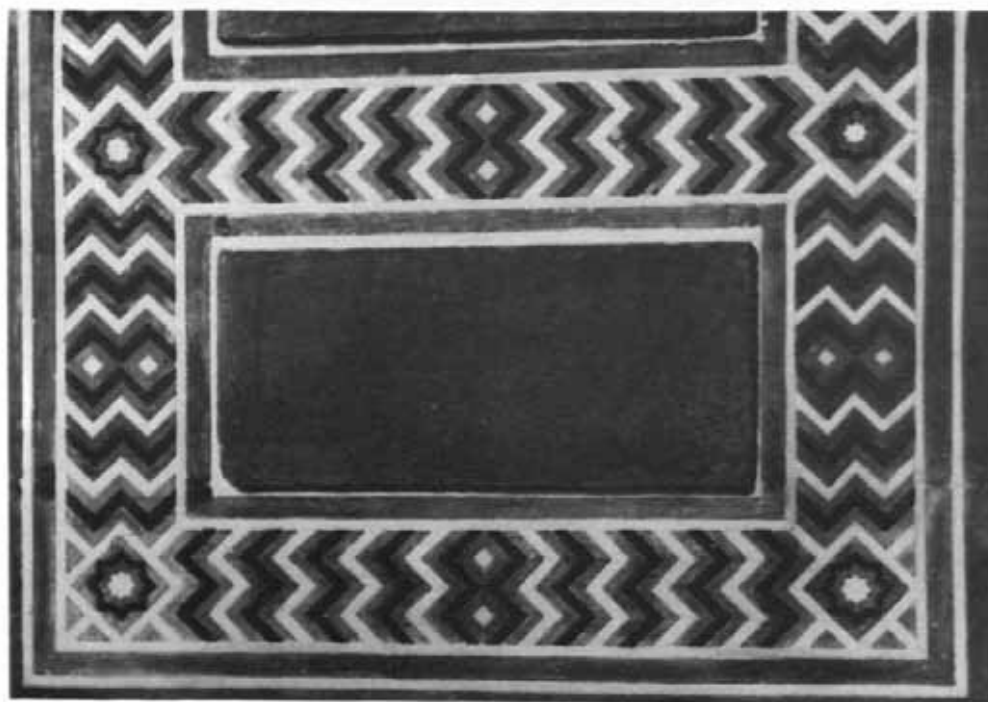


B



A

Agra : Jahangiri Mahal, A, before and B, after conservation of main entrance. See p. 156



B

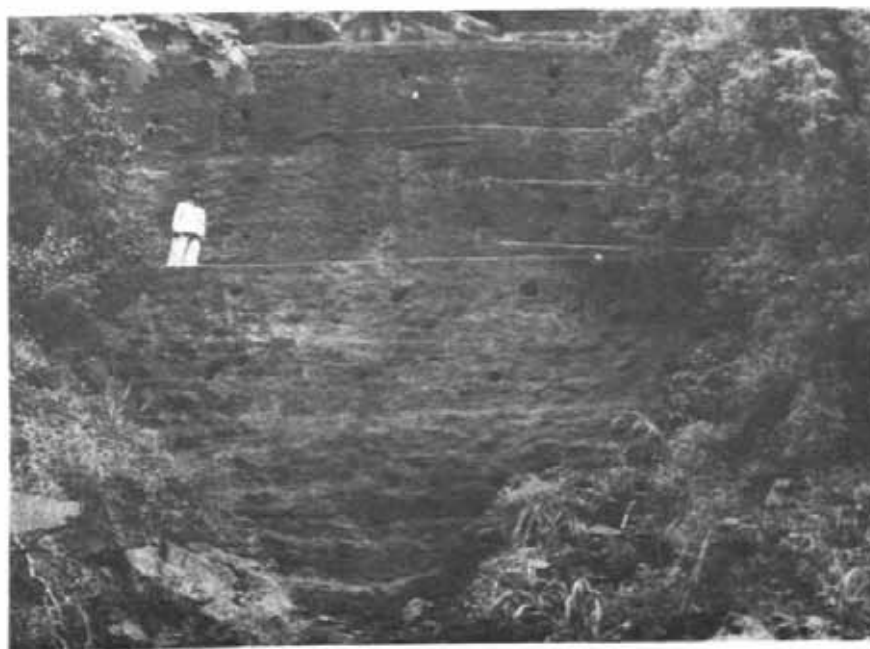


A

Agra : Taj Mahal, A, before and B, after restoration of inlay-work. See p. 156



A



B

Ajanta : Cave 16, A, before and B, after conservation of retaining-wall. See p. 158



A



B

Kamalapuram : Pattabhirama temple, A, before and B, after conservation of maha-mandapa. See p. 160



A

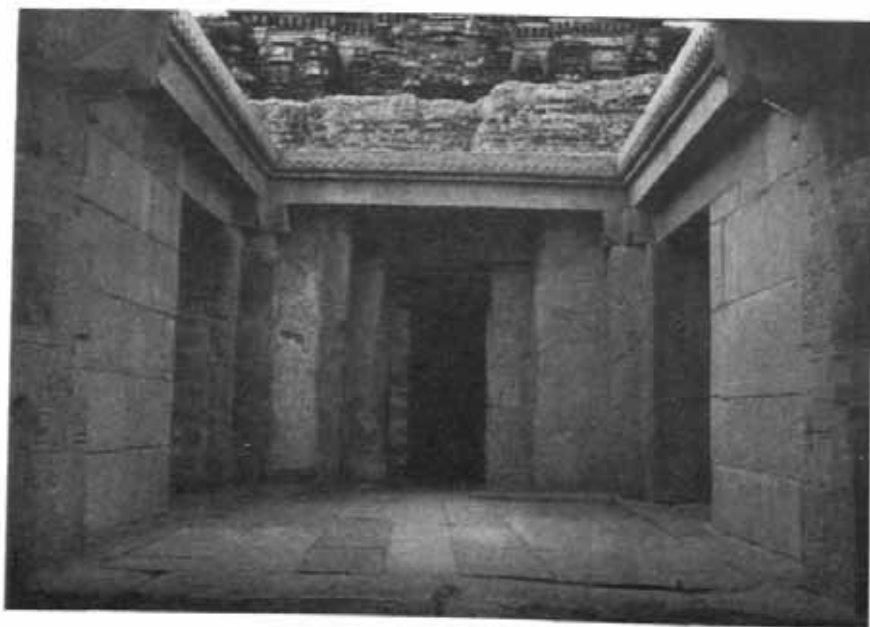


B

Krishnapuram : Krishna temple, A, before and B, after conservation of cloister-mandapa. See p. 160



A



B

Venkatapuram : Vitthala temple, A, before and B, after conservation of ardha-mandapa. See p. 160



A



B

Chitradurga : Murugha Rajendra matha, A, before and B, after conservation. See p. 161



A



B

Suhania : Kakanmath temple, A, before and B, during conservation of southern jagati. See p. 165



A



B

Suahanīa : Kakanmath temple, A, before and B, after conservation of southern jagati. See p. 165



A



B

Udayagiri : stupa. A, before and B, after conservation of floor and vertical sides. See p. 167

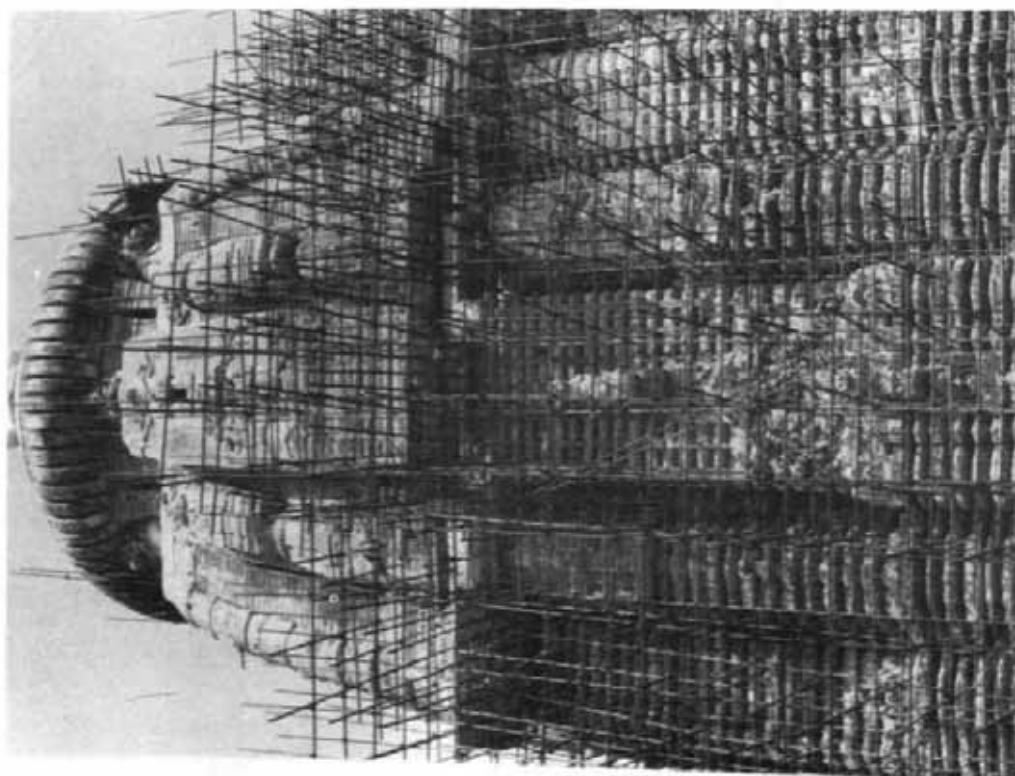
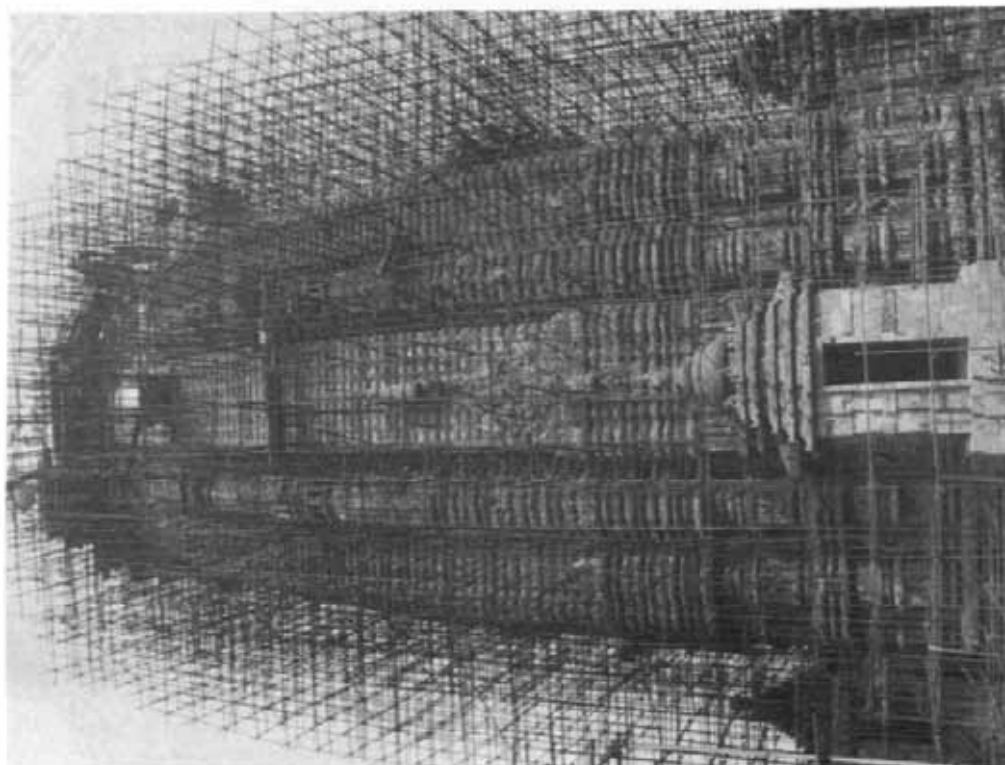


A



B

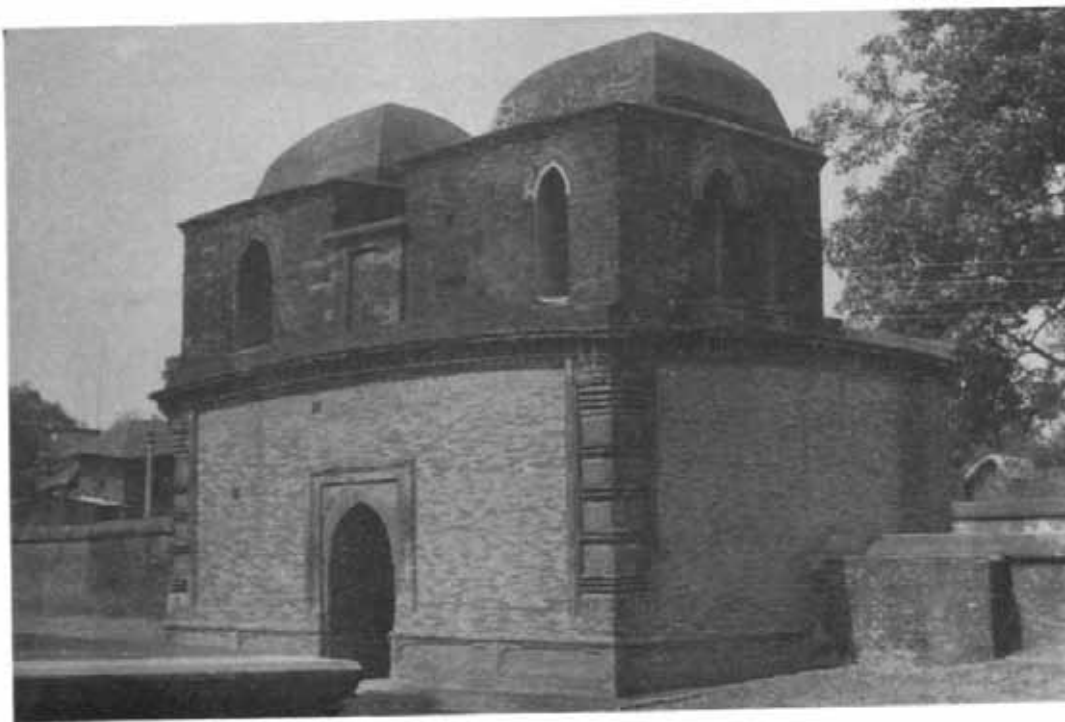
Udayagiri : Buddhist site, A, before and B, after conservation of sanctum and western wing of monastery. See p. 167



Puri : Jagannatha temple, during conservation. See p. 168

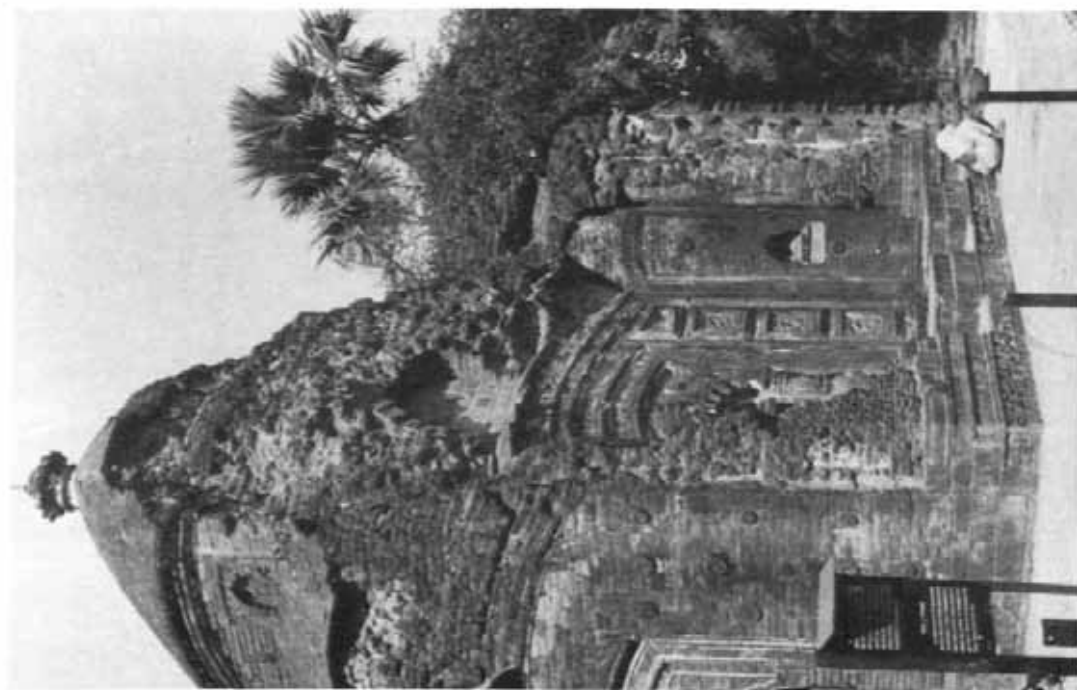


A

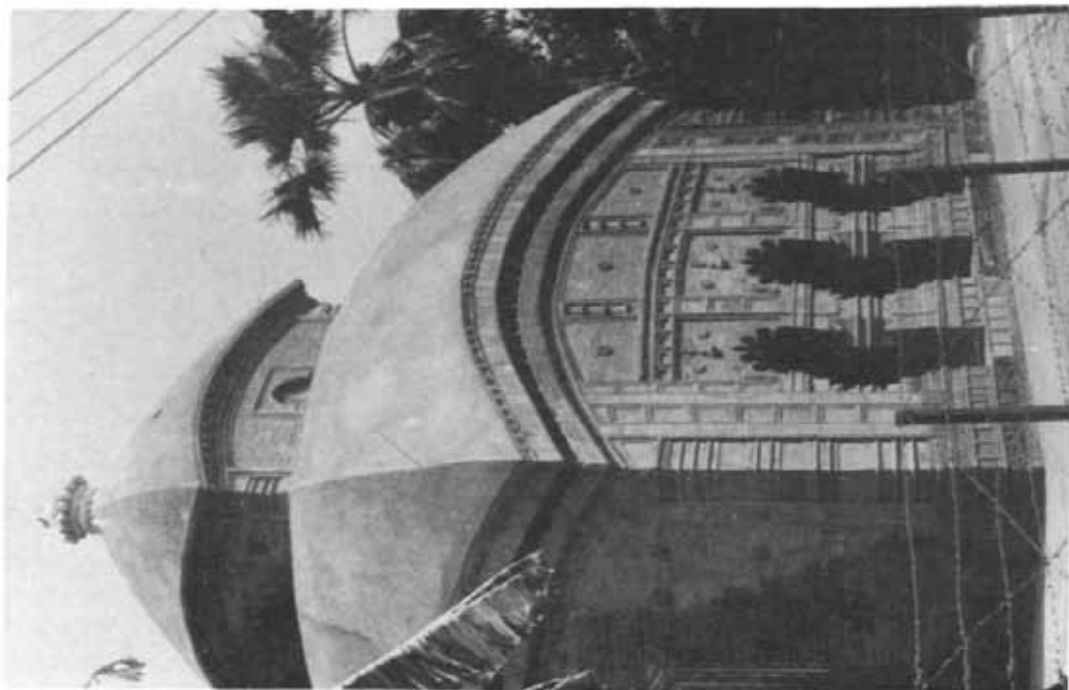


B

Bishnupur : Radheyshyam temple, A, before and B, after conservation of gateway. See p. 168



A



B

Bishnupur : Radha-Binod temple, A, before and B, after conservation of frontal porico. See p. 169



B



A

Calcutta : Maharshi Bhavan, A, before and B, after conservation. See p. 169



A



B

Thanesar : Harsh-Ka-Tila, A, before and B, after conservation of excavated remains. See p. 170



A

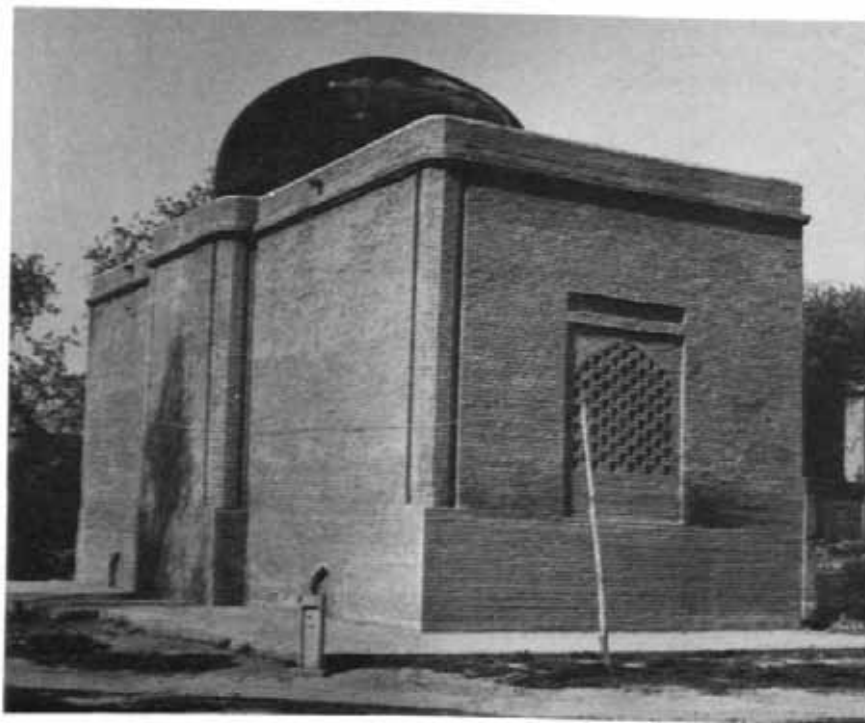


B

Jalandhar : Dakhni Sarai, A, before and B, after conservation of eastern gateway. See p. 171

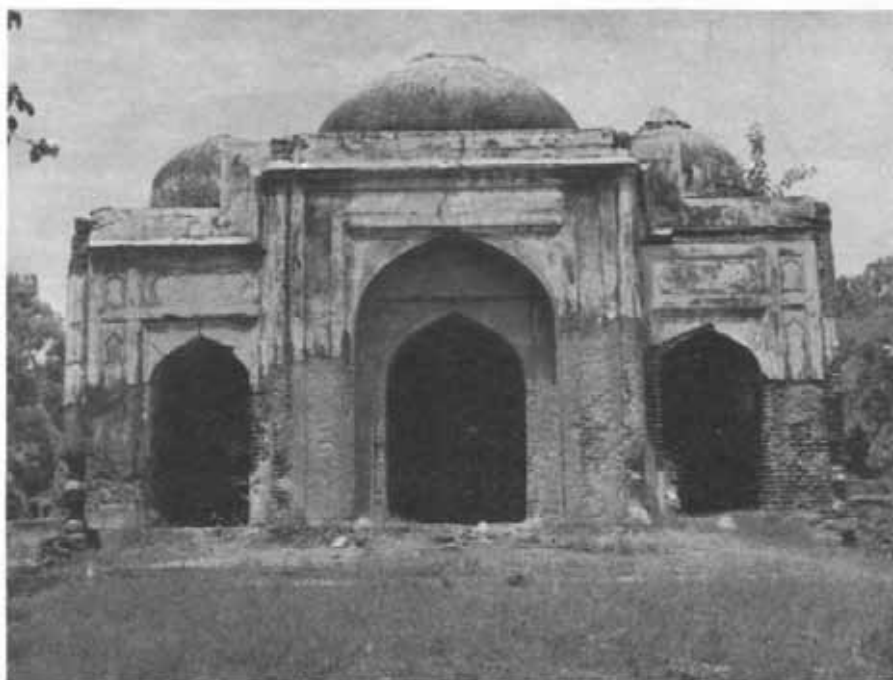


A

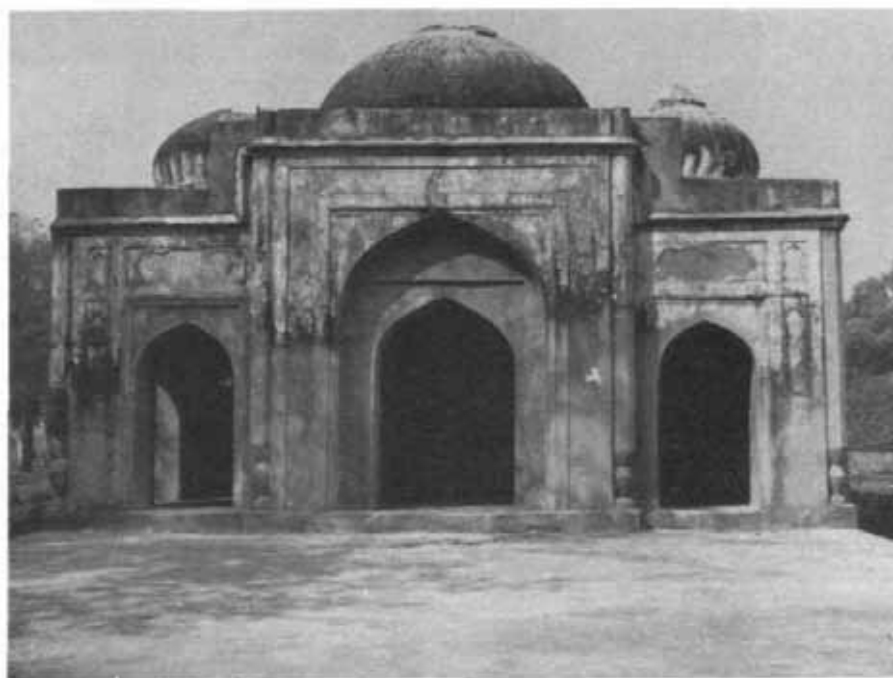


B

Jalandhar : Noormahal, A, before and B, after conservation of mosque inside sarai area. See p. 171



A



B

Delhi : Lodi Garden, A, before and B, after conservation of mosque. See p. 172



A



B

Delhi : Lodi Garden, A, before and B, after conservation of double-storeyed structure. See p. 172



B



A

Delhi : Qutb Minar, A, before and B, after conservation. See p. 172

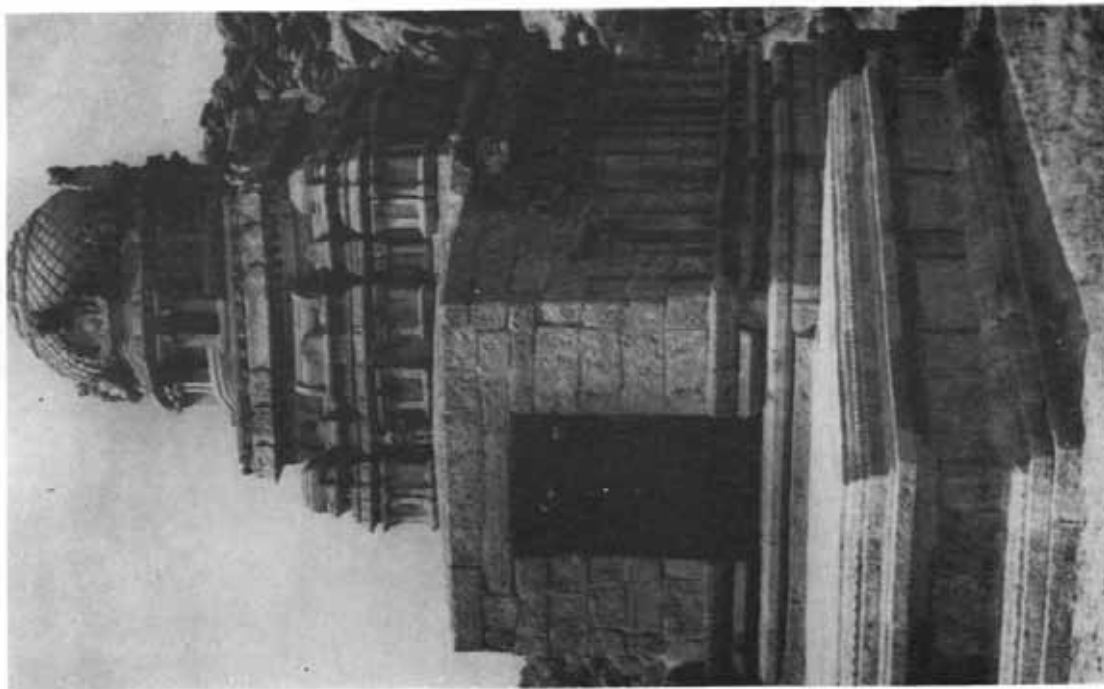


A

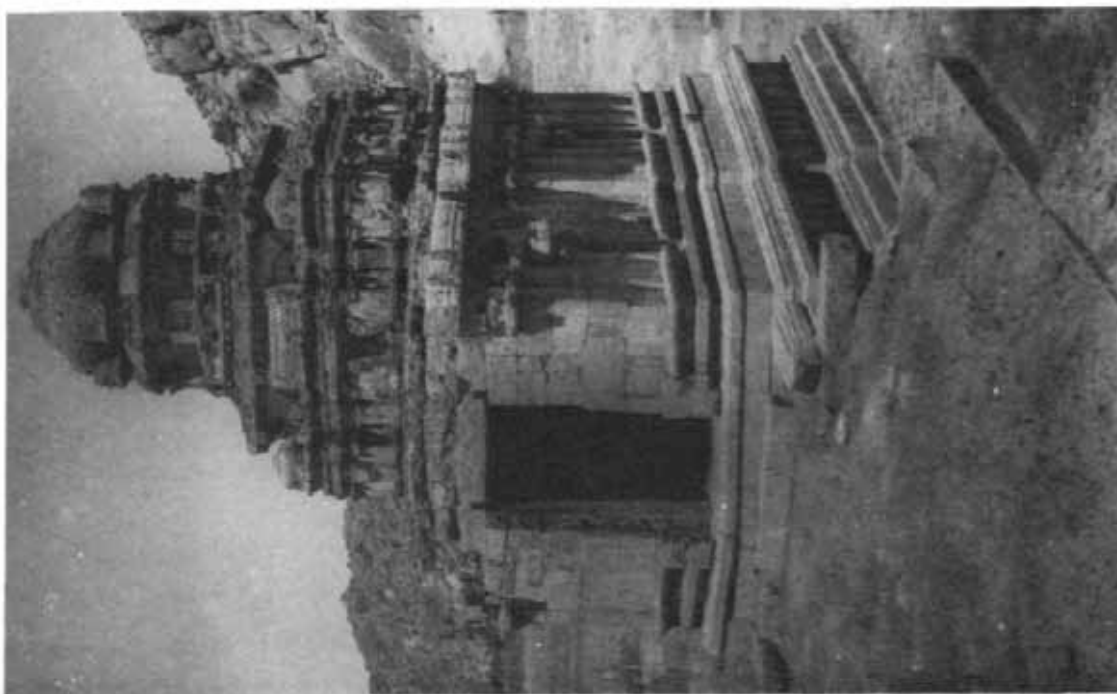


B

Suriyur : Tiruvilangudy Siva temple, A, before and B, after conservation of mukha-mandapa. See p. 183



B



A

Narasingarayanpettai : Pattabhirama temple, A, before and B, after conservation of Andai shrine. See p. 183



A



B

Jaunpur : Old fort, A, before and B, after conservation of southern bastion and parapet. See p. 185



A

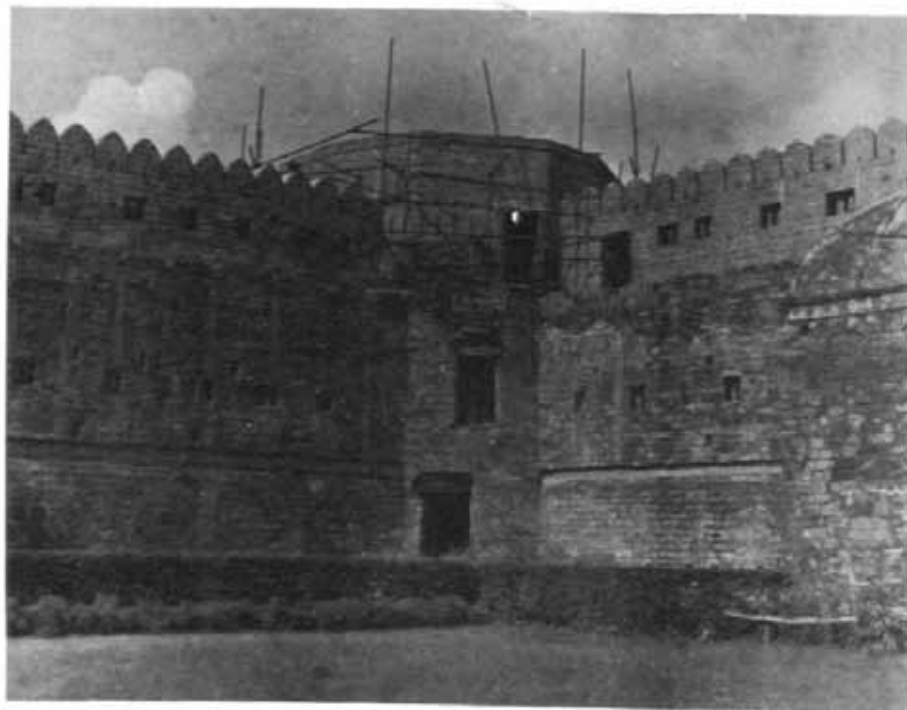


B

Sarnath : Chaukhandi stupa, eastern side, A, before and B, after conservation. See p. 185



A



B

Udhampur : Ramnagar fort, A, before and B, after conservation. See p. 186

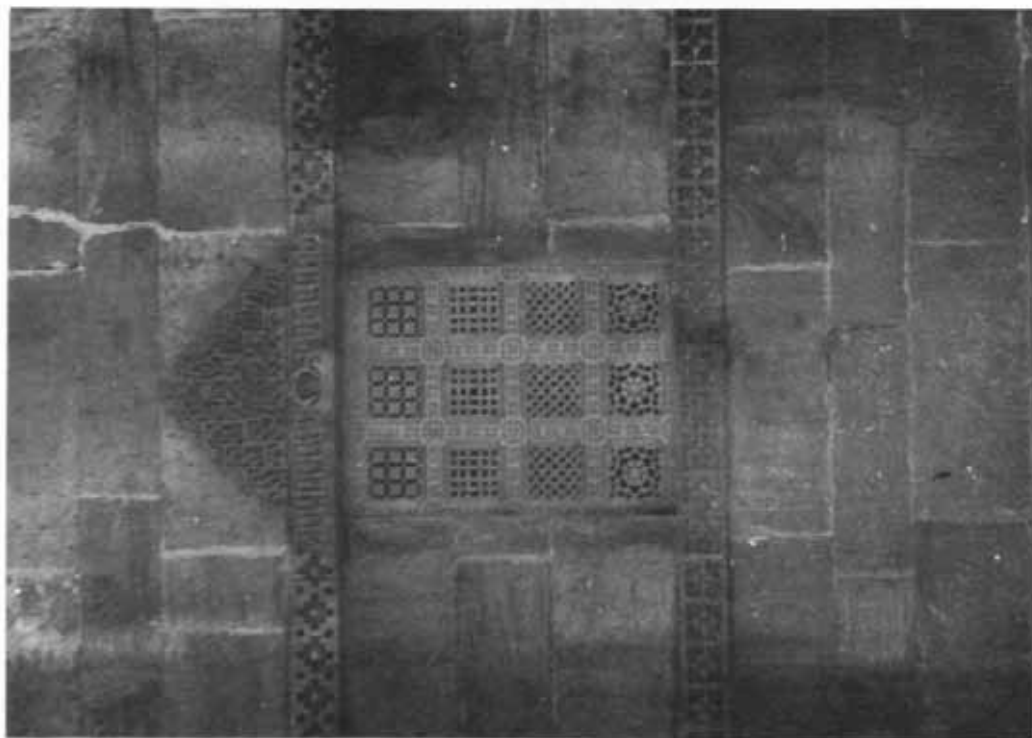


A

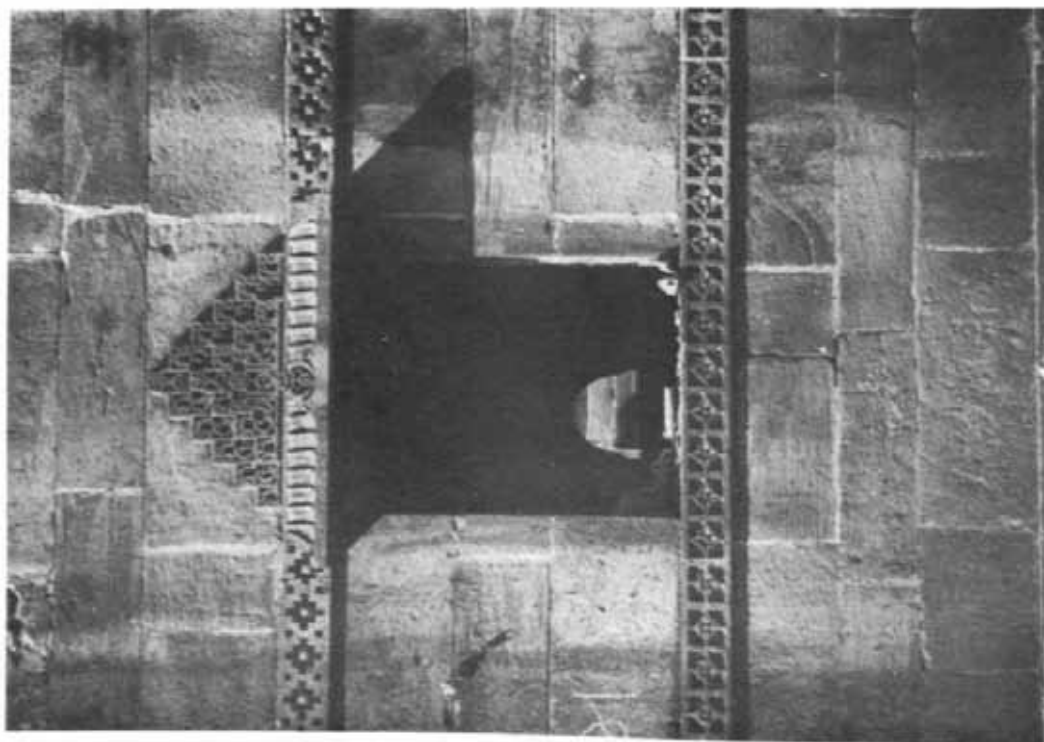


B

Ladakh : Tisseru, A, before and B, after conservation of stupa (eastern side). See p. 186



B

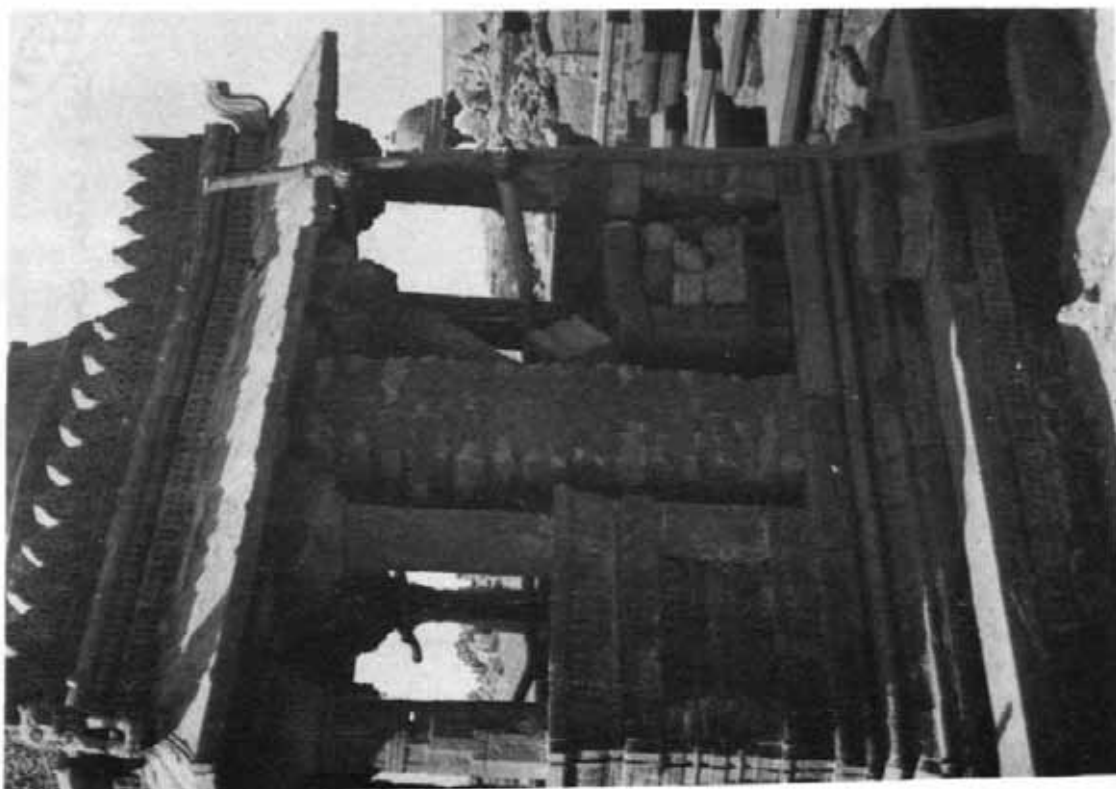


A

Sarangpur : Queen's mosque, A, before and B, after conservation. See p. 187



B



A

Bhuj : Rao Lakha Chhatra, A, before and B, after conservation. See p. 187



A

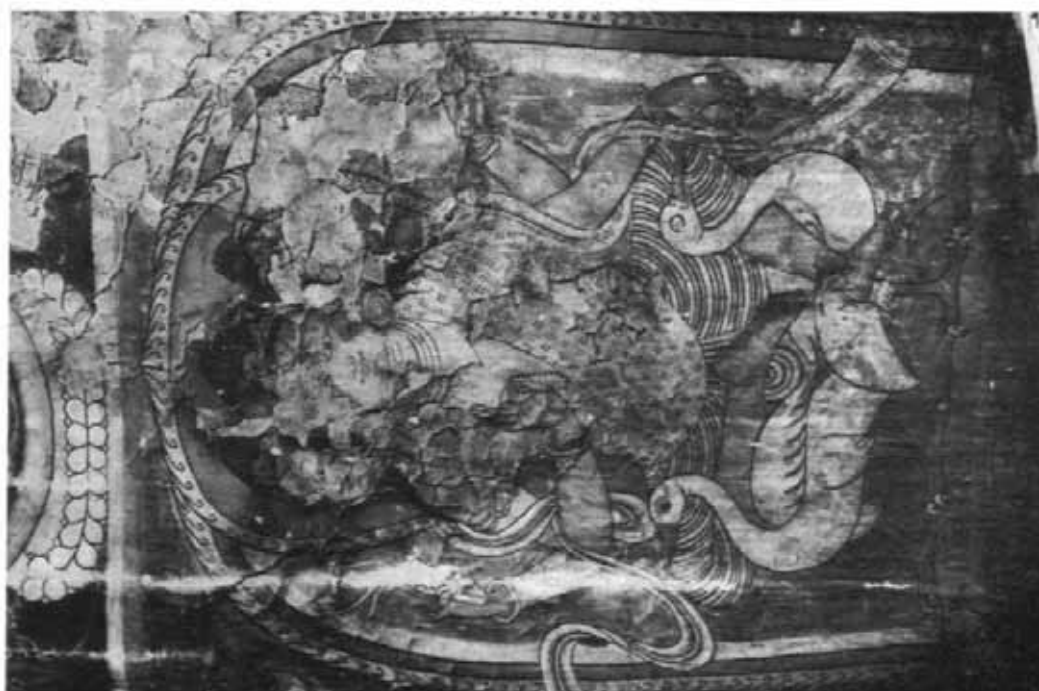


B

Bhuj : Rao Laxkha Chhatri, A, before and B, after conservation. See p. 187



B



A

Tabo : A, Buddhist monasteries, before and B, after chemical treatment of painting in Dowang gampha. See p. 194

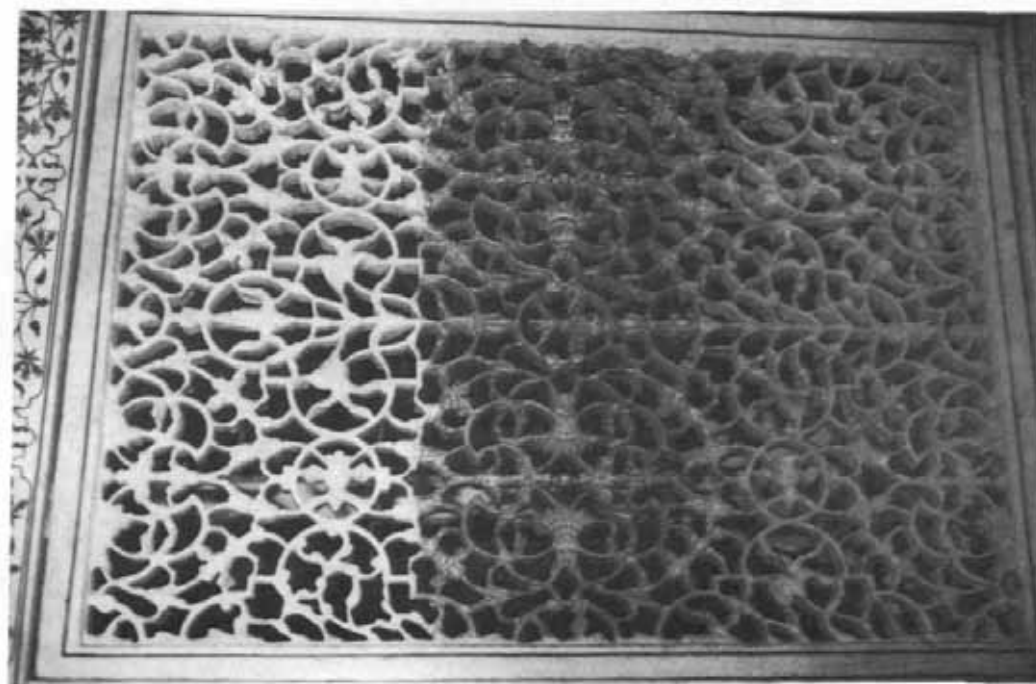


B

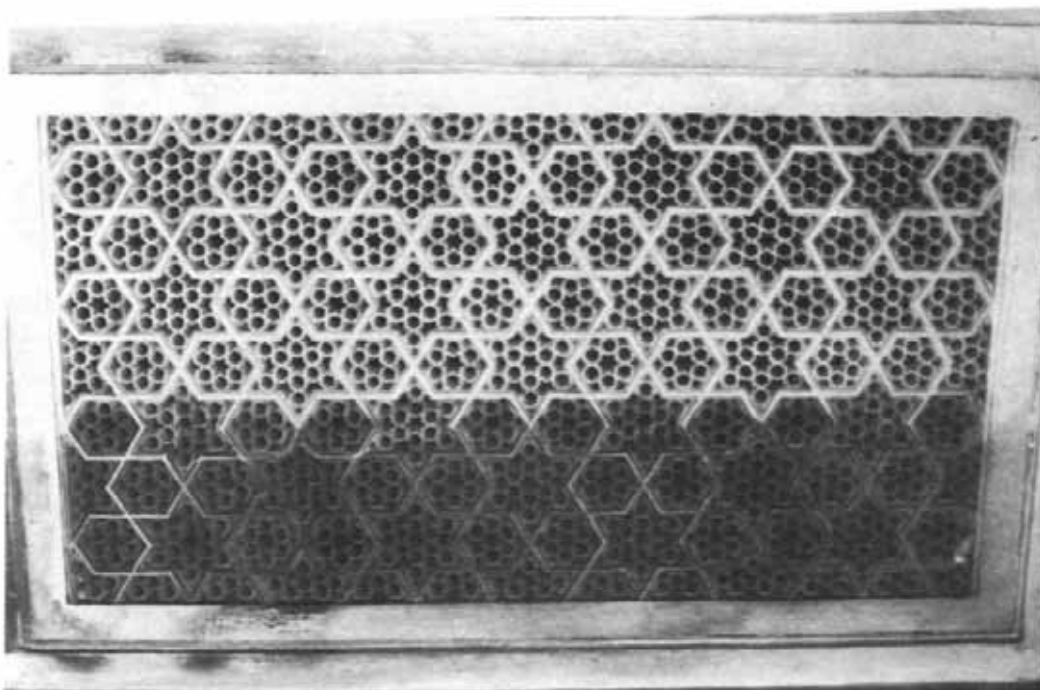


A

Leh : Shey palace, A, before and B, after chemical treatment of painting in upper hall. See p. 195



B



A

Agra : A, Itmad-ud-Daula; B, Taj Mahal, marble- screen during chemical treatment. See pp. 200-201

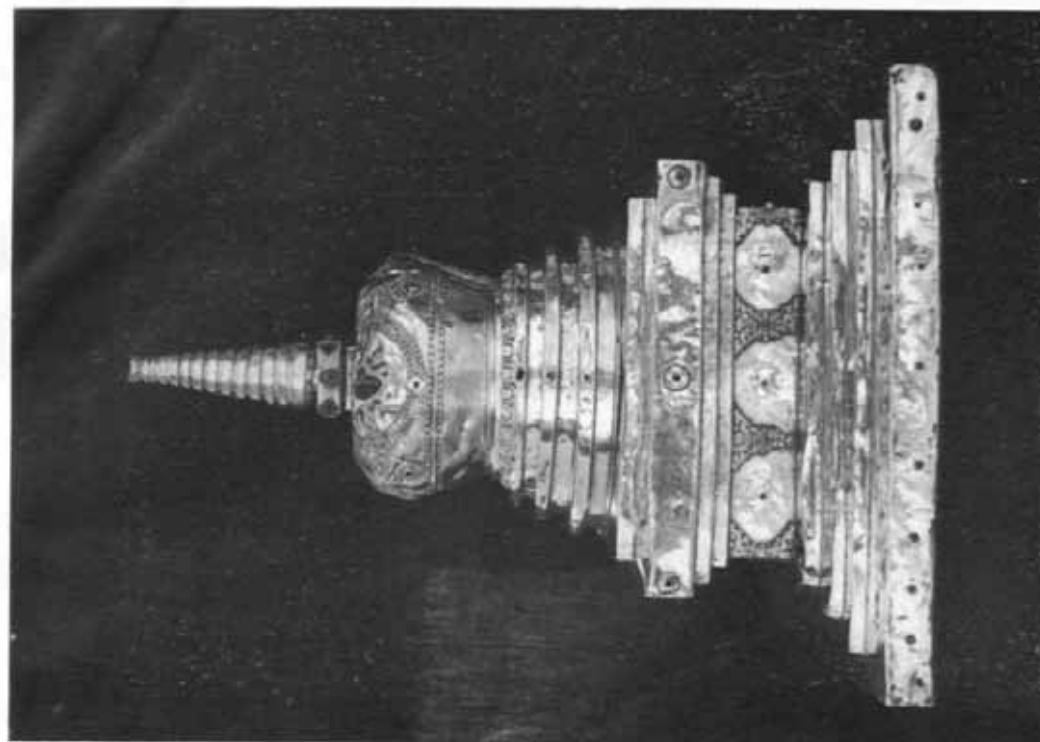


B

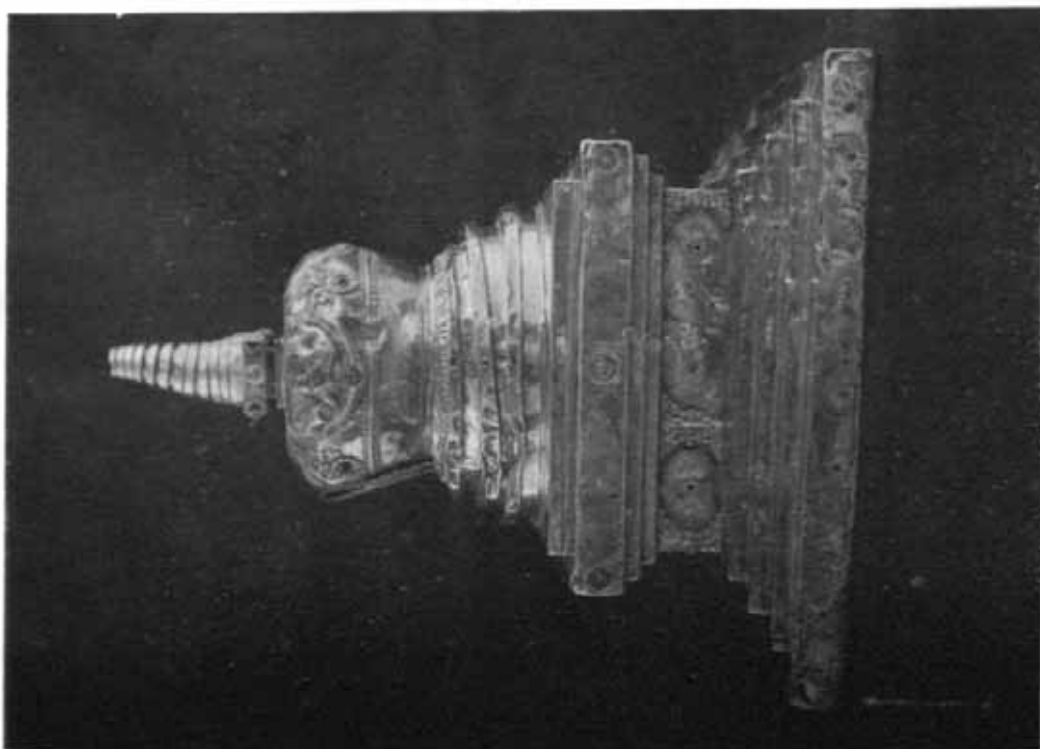


A

Jageshwar : Paun Raja, A, before and B, after chemical treatment. See p. 202

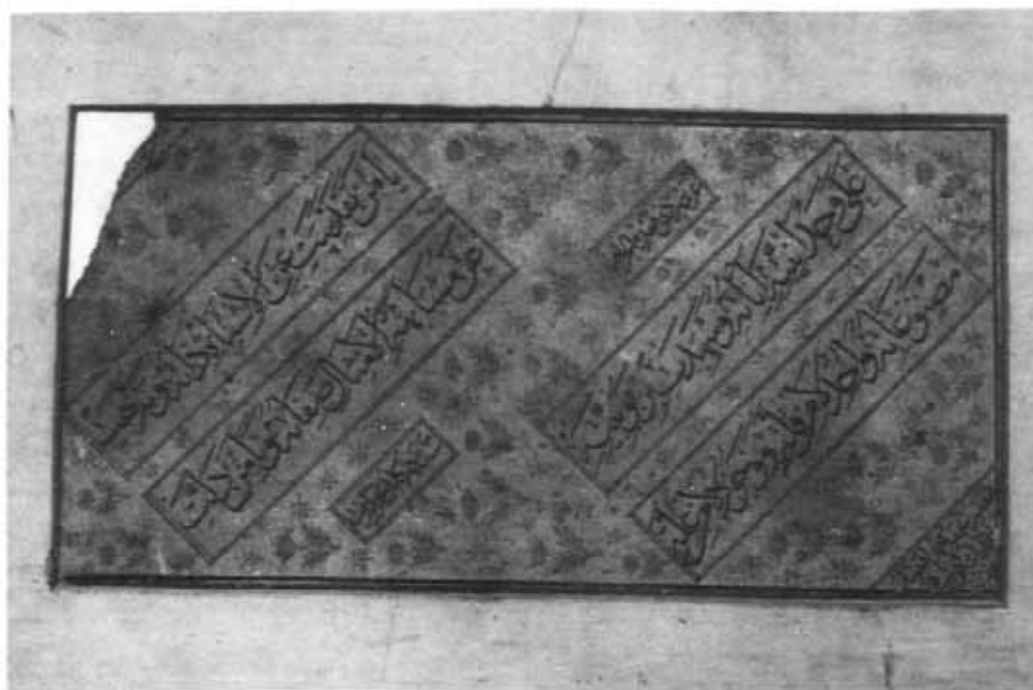


B

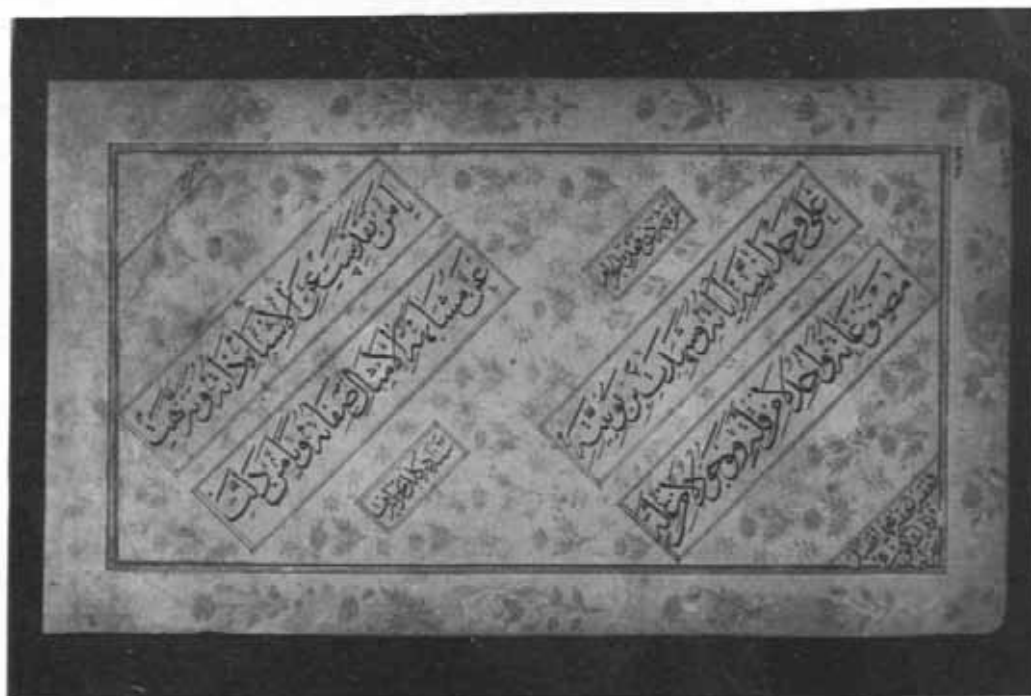


A

4 Sikh LI REGIMENT : chorten, A, before and B, after chemical treatment. See p. 203



A



B

Agro, Taj Museum : seventeenth century calligraphic manuscript, A, before and B, after chemical treatment. See p. 203



ARCHAEOLOGICAL SURVEY OF INDIA

